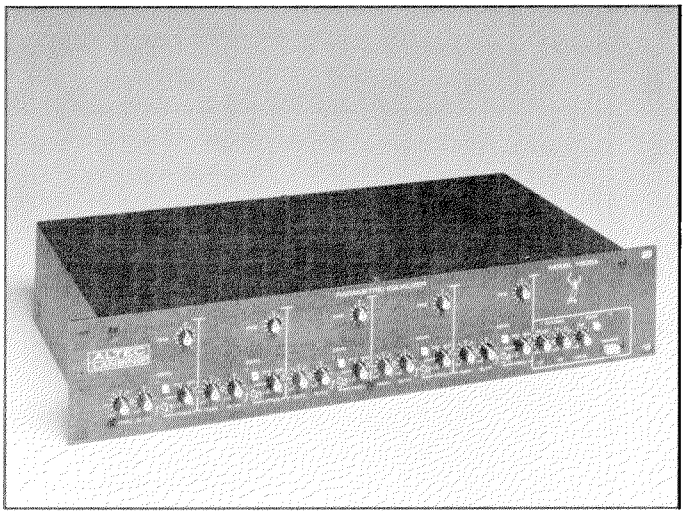
ALTEC LANSING

1905A
Variable Bandwidth
5 Band Parametric Equalizer



KEY FEATURES

- ★ **Five bands of equalization with variable frequency range**
- ★ **Variable bandwidth**
- ★ **Variable low-pass and high-pass filters**

KEY SYSTEM SPECIFICATIONS

Frequency Ranges:	
Coarse:	17 Hz - 130 Hz 170 Hz - 1.3 kHz 1.7 kHz - 13 kHz
Fine:	16.5 Hz - 205 Hz 165 Hz - 2.05 kHz 1.65 kHz - 20.56 kHz
Maximum Boost/Cut:	+15/-25 dB
Bandwidth:	Variable from 1/12 - 2 octaves
Low-Pass Filter:	2.5 kHz - 30 kHz, 12 dB/octave
High-Pass Filter:	15 Hz - 300 Hz, 12 dB/octave
Frequency Response:	20 Hz - 20 kHz, ±1.5 dB
Distortion (@ +4 dBm):	< 0.01 % @ 1 kHz
Equivalent Input Noise (20 Hz - 20 kHz, unweighted):	< -90 dBm

DESCRIPTION

The Altec Lansing **1905A** is a boost and cut five band Parametric Equalizer whose primary use is for tuning the overall frequency response of a sound reinforcement system, both to increase gain-before-feedback and to compensate for the deficiencies in the acoustic environment and the sound system.

The ability to control both the bandwidth and center frequency of a bank of filters as well as the degree of boost or cut opens up a new dimension in equalization allowing filter correction and creative filtering capabilities of unparalleled accuracy and precision.

Each of the five parametric filters allows a range from +15 dB of boost to -25 dB of cut at variable frequencies per band.

A high-pass filter control, with a variable corner frequency range of 15 Hz - 300 Hz and 12 dB per octave slope, is located on the front panel along with a low-pass filter control, with a variable corner frequency range of 2.5 kHz - 30 kHz and 12 dB per octave slope. A master level control allows the signal to be boosted up to 6 dB or cut to -∞. A master EQ-IN switch allows the user to remove the equalizer from the signal path.

The **1905A** can be used as a stand alone parametric equalizer, or can be utilized in conjunction with the TEF 20 and AcoustaEQ software. This allows a higher degree of accuracy in the equalization process.

1905A Specifications (cont'd)

Inputs:	One
Type:	Balanced (electronically)
Impedance:	
Balanced:	20 kΩ
Unbalanced:	10 kΩ
Outputs:	One
Type:	Balanced
Min. Load Impedance:	600 Ω
Source:	< 60 Ω
Maximum Level:	+22 dBm
Performance:	
Channel Separation:	> 80 dB @ 1 kHz
Overall Gain:	+6 dB
Overload Indicator:	+19 dBu
Connections:	
Input:	3 pin XLR female
Output:	3 pin XLR male

TEF-20 Interface:	
Input:	Two BNC
Outputs:	BNC
Power:	3 pin IEC
Power Requirements:	
Voltage:	110/120/220/240V, 50/60 Hz
Consumption:	< 15 VA
Weight:	
Net:	9.92 lbs (4.5 kg)
Shipping:	15.44 lbs (7 kg)
Dimensions:	
Width:	19 inches (482 mm)
Depth:	9.25 inches (235 mm)
Height:	3.5 inches (89 mm)

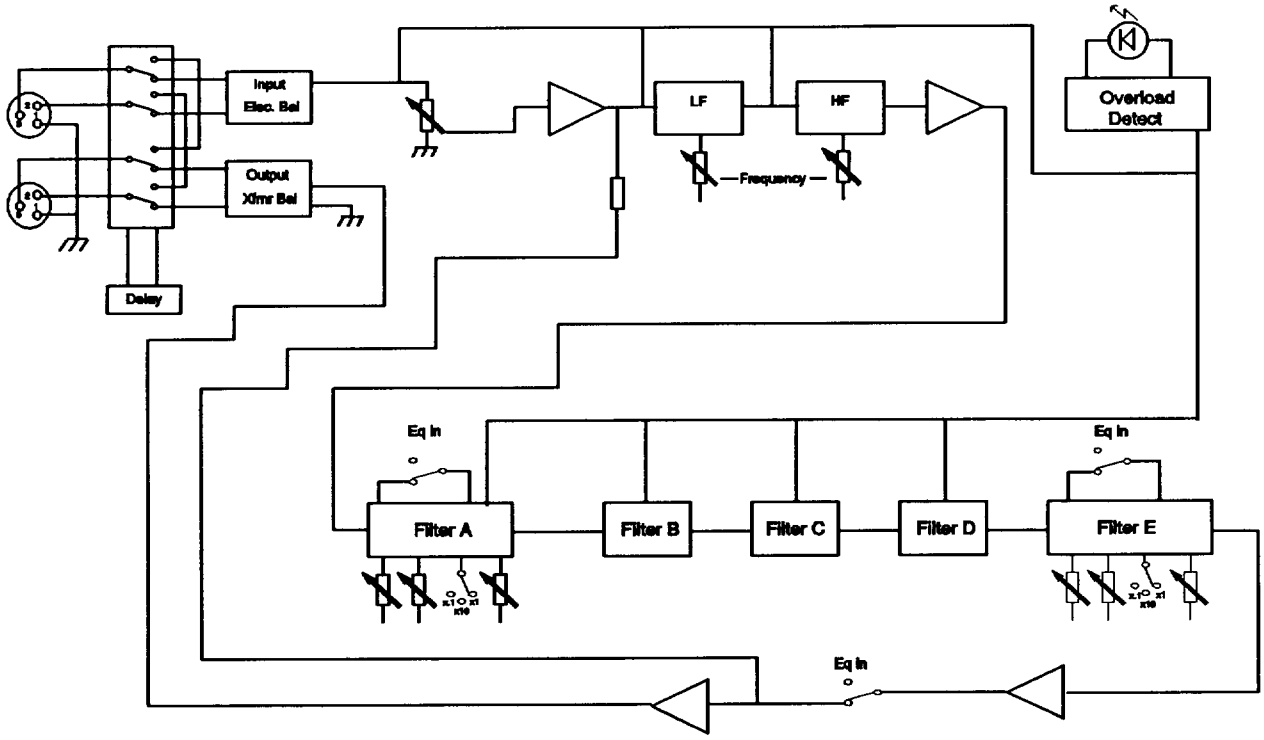


Figure 1 Block Diagram of the 1905A

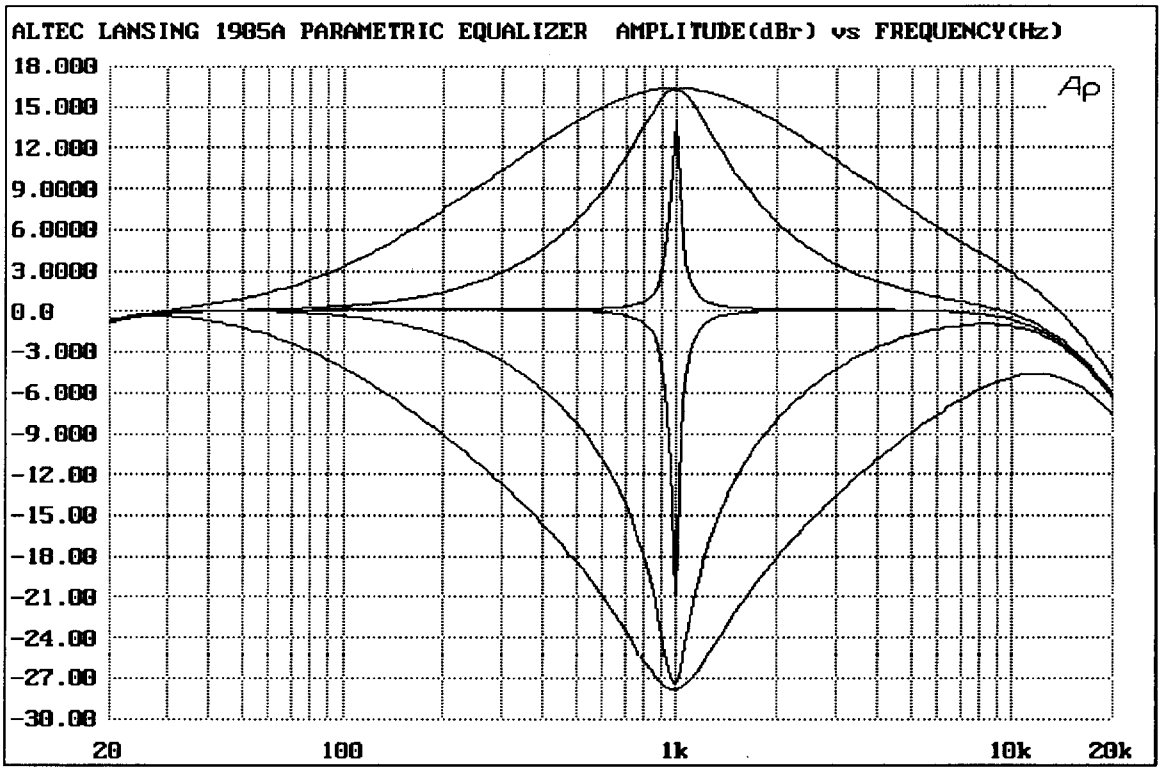


Figure 2 Variable Bandwidth at 1 kHz

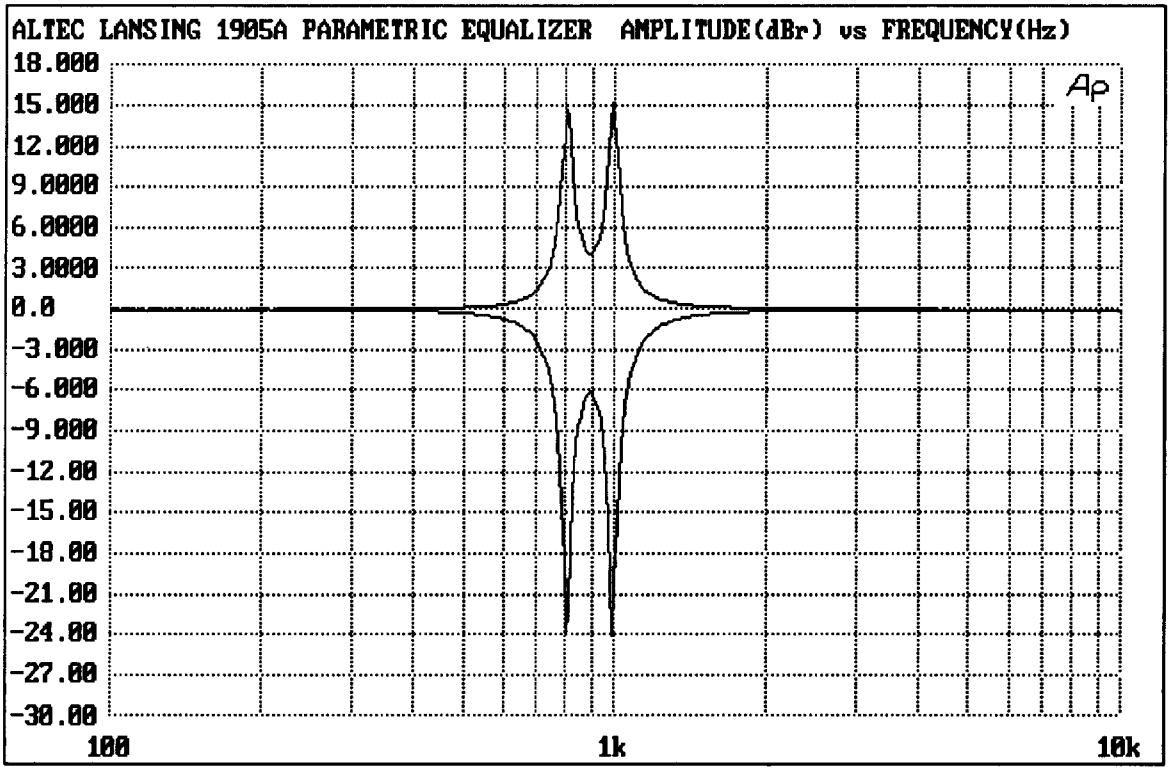


Figure 3 Two Adjacent Bands, 800 Hz and 1 kHz, Full Boost and Cut

ARCHITECT'S and ENGINEER'S SPECIFICATION

The equalizer shall have 5 bands with a coarse adjustable frequency range of 17 Hz - 13 kHz, and a fine range of 16.5 Hz - 20.56 kHz. Furthermore, the filters shall provide a variable boost/cut of +15/-25 dB per band.

The front panel shall have the following controls per band: a gain control that is variable from +15 dB to -25 dB; a bandwidth control which is variable from 1/12 to 2 octaves; a coarse frequency control which is variable from 170 Hz and 1.3 kHz; a fine frequency control that is variable between 165 Hz and 2.05 kHz; a multiplier switch which changes the overall frequency by .1x, 1x, or 10x; an equalizer in/out switch with LED indicator. The front panel master controls shall be: a low pass filter variable from 2.5 kHz to 30 kHz, 12 dB/octave; a high pass filter variable from 15 Hz to 300 Hz, 12 dB/octave; a master gain control variable from -∞ to +6 dB; a master equalizer in/out switch with LED indicator; an overload indicator; and an on/off switch.

The rear panel shall have input and output connectors, input and output connectors for use with the TEF-20, a ground lift switch, an IEC connector, and a 5x20 mm fuse holder.

The input shall be electronically balanced through a 3 pin female XLR. The output shall be balanced through a 3 pin XLR. The TEF-20 connectors shall be BNC type.

The equalizer shall meet or exceed the following performance specifications: frequency response at unity gain, 20 Hz - 20 kHz, ±1.5 dB; an input noise level of less than -90 dBm; balanced input impedance of 20 kΩ; a maximum output level of +22 dBm into loads greater than or equal to 600 Ω.

The equalizer shall operate on 110/120/220/240 Vac, 50/60 Hz, and consume less than 15 VA. The chassis shall be steel with a black front panel and top, bottom, sides, and back with white nomenclature. The chassis shall have the following dimensions: Height: 3.5 inches; Depth: 9.25 inches; Width: 19 inches. The weight shall be 9.92 lbs.

The equalizer shall be the Altec Lansing model **1905A.**

ALTEC LANSING

a MARK IV company

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ALTEC LANSING

the sound of experience.

1905A

5 Band Parametric Equalizer

Operating and Service Instructions

ALTEC LANSING CORPORATION

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P.O. Box 26105 • Oklahoma City, OK • 73126-0105 USA • Tel: (405) 324-5311 • FAX: (405) 324-8981

Table of Contents

1 ELECTRICAL

1.1 110 Vac, 50/60 Hz Operation

The unit is set at the factory to operate at 110 Vac, 50/60 Hz. The correct fuse and fuse label should be in place for 110 Vac operation.

1.2 220 Vac, 50/60 Hz Operation

In order to change the voltage setting on the **1905A**, you must perform the following steps:

1. Slide the switch to the 220 Vac position.
2. Replace the fuse with the 220 Vac accessory fuse supplied with the unit.
3. Remove the 110 Vac decal located near the 110/220 Vac switch.

2 INSTALLATION

2.1 Rack Mounting

The Equalizer may be installed in a standard 19 inch equipment rack. It requires 3½ inches of vertical rack space and secures to the rack cabinet with the four rack mount screws and cup washers provided in the hardware kit.

2.2 Ventilation

The equalizer should be adequately ventilated to avoid excessive temperature rise. It should not be used in areas where the equalizer is subjected to excessive dust or mechanical vibrations.

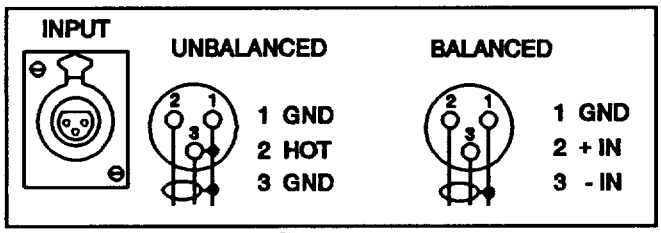

Figure 1 XLR Input Connections

3 SIGNAL CONNECTIONS

3.1 Input Connection

The input connection is made through a female XLR connector on the back of the unit. See Figure 1. The input circuitry utilizes a transformerless electronically-balanced design. The unit can be configured to accommodate either XLR standard by removing the top cover and changing the orientation of the 4 plug-in connectors as shown by the legend silkscreened on the PCB. See Figure 2.

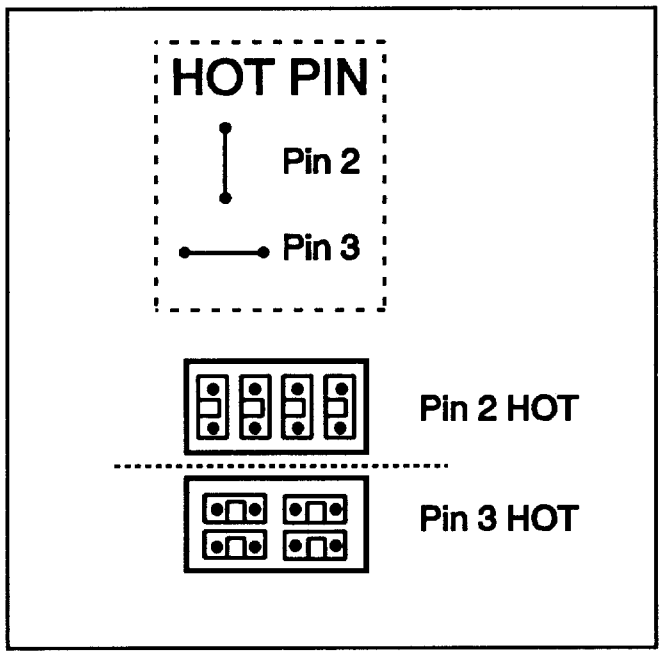

Figure 2 XLR Pin Configurations

3.2 Output Connection

The output connection is made through a male XLR connector also found on the back of the unit. See Figure 3. The output is transformer-balanced to provide the benefit of common mode rejection to help eliminate externally induced interference such as main power supply hum. Transformer balanced outputs are very useful when long cable runs are used between pieces of equipment where different earth potentials can cause grounding problems.

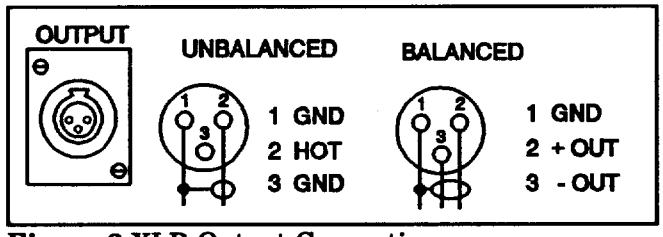

Figure 3 XLR Output Connections

4 FRONT PANEL FUNCTIONS

The following highlights the operation of the various controls found on the front panel. Refer to Figure 4 for the arrangement of the controls.

Power Switch - When power is turned "on", the delay circuit causes a 2 second delay before the relay circuit is energized. As power is turned "off", the relay is immediately switched off to avoid transients at the output. In the event of a power failure, the equalizer is bypassed silently with no interruption of the signal.

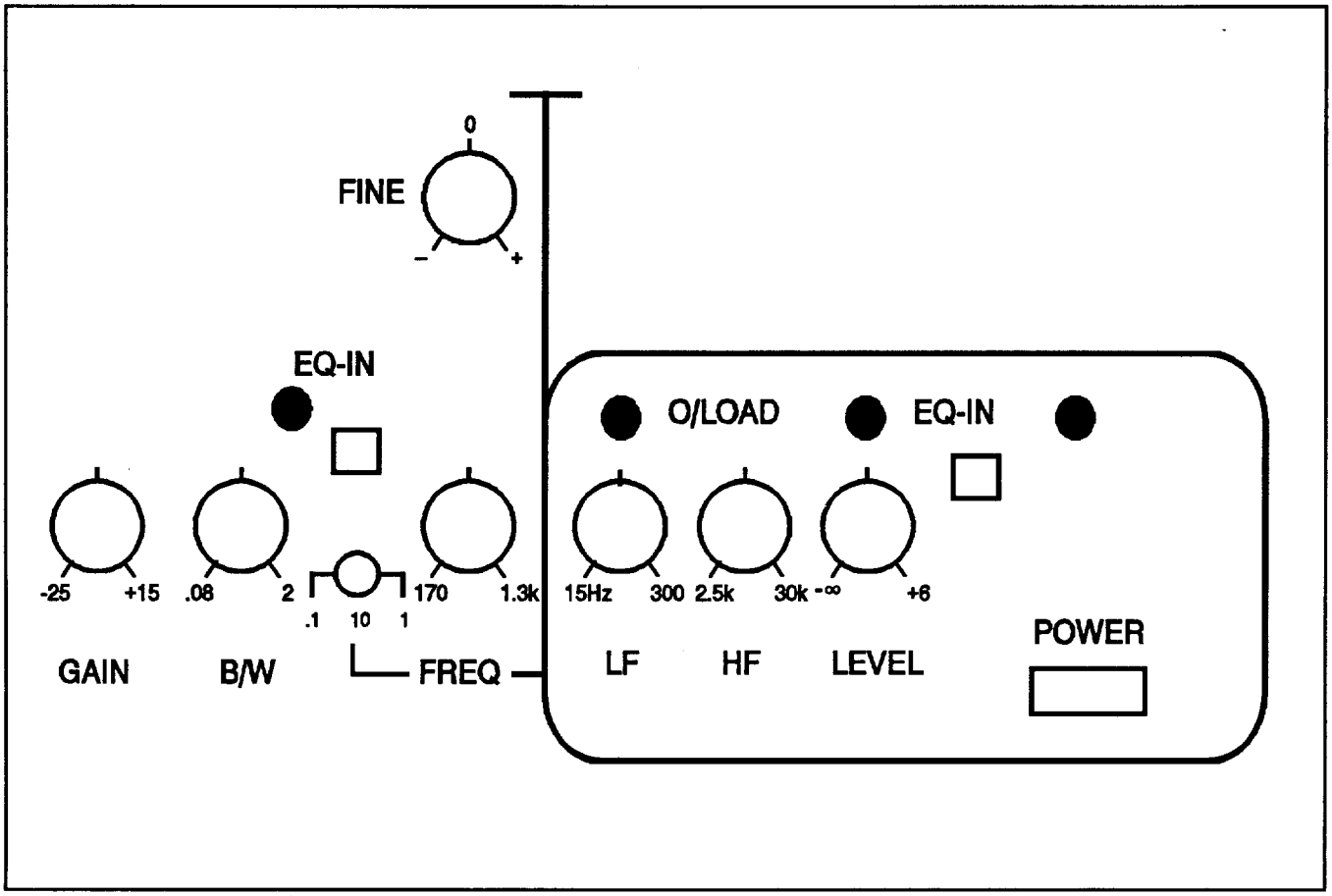

Figure 4 Front Panel Controls

EQ In/Out Switch - EQ "in" status is indicated by an LED. When the switch is "off", the high and low pass filters, along with the equalizer section, are removed from the signal path. The circuitry of the **1905A** allows for an uninterrupted transition when bypassing the equalizer section from the signal path.

Overload LED - The overload LED will illuminate if the input signal exceeds +19 dB. To correct this condition, the input signal must be turned down.

Low Frequency Filter - This section offers a continuously variable, 12 dB/octave, 2nd order Butterworth high-pass filter adjustable from 15 Hz to 300 Hz.

High Frequency Filter - This section offers a continuously variable, 12 dB/octave, 2nd order Butterworth low-pass filter adjustable from 2.5 kHz to 30 kHz.

Level Control - This control is a center-detented pot which permits up to +6 dB of gain when adjusted fully clockwise and full attention when adjusted fully counter-clockwise.

Channel EQ-in - EQ "in" status is indicated by the LED associated with the individual channels. When the channel EQ switch is off, the individual channel EQ parameters are removed from the signal path. When the master EQ-in switch is off, all 5 bands are simultaneously removed from the signal path. All 5 parametric filters are identical and connected in cascade in the circuit.

Gain Control - Adjustable between +15 dB and -25 dB for the individual parametric filters. A center-detented control is used to indicate the "flat" position.

Bandwidth Control - The filter bandwidth control is adjustable from 1/12 (.08) octave when fully counter-clockwise to 2 octaves when fully clockwise.

Range Switch - Selects the range of the frequency band.

(X) .1 - 17 Hz to 130 Hz
(X) 1 - 170 Hz to 1.3 kHz
(X) 10 - 1.7 kHz to 13 kHz

Frequency Control - Sets the center frequency of the individual parametric band within the limits of the range switch.

Fine Control - Allows "fine-tuning" control of the center frequency within limits of the course frequency control.

5 APPLICATIONS

5.1 The Uses of Parametric Equalizers

The **1905A** parametric equalizer allows the user to have total control over the main filter parameters. The center frequency of each filter is completely adjustable by using the course frequency control and the fine-tune frequency control. The degree of boost or cut, along with the bandwidth, are also user adjustable on each of the five filters. Because of the accuracy and versatility associated with parametric design, the **1905A** can be used to perform detailed narrow band correction or to provide precision notch filtering of narrow band resonances or feedback frequencies.

The ability to accurately "notch-out" a troublesome frequency or frequency component enables the **1905A** parametric equalizer to be used very effectively to remove unwanted "hum" or frequency components in live sound reinforcement, or in public address systems to control feedback without adversely affecting other areas of the frequency spectrum. In addition to compensating for room acoustics, equalization can also be used to counteract some of the problems caused by microphone characteristics and positioning, or to tailor the response to improve speech intelligibility. Furthermore, many speaker systems have a far from flat response, particularly mobile systems that have to be positioned in physically convenient places rather than the acoustically ideal ones. The versatility of parametric equalization opens up a new dimension in filter correction and creative filtering capabilities of unparalleled accuracy and precision.

Because the **1905A** parametric filter stages are cascaded with one another and any filter can be set to any desired frequency, they can be combined to create more than their individually available +15 or -25 dB of boost and cut. For example, setting two filters to the same frequency and with the same settings for bandwidth and gain will result in double the amplitude of cut or boost. Therefore, it is good practice to set all the gain controls to their center (detent) positions and put each section into by-pass before starting to create an equalization curve. This deters any high gain signals from being immediately transmitted into the signal chain thereby preventing corresponding overload of subsequent stages or severe feedback in live sound reinforcement situations. It is also good practice to set any unused filter to a medium bandwidth such as 0.5. This reduces the possibility of introducing extraneous noise into the signal chain which would raise the noise floor and reduce the available dynamic range.

After setting an appropriate equalization curve, it may be necessary to adjust the overall gain to either avoid overloading the subsequent system stages when gain has been used, or to increase the level of the signal where a substantial degree of cut has been introduced.

The Q of the **1905A** parametric filters is designed to change slightly with the degree of boost or cut applied. This does not compromise the narrowness of a notch filter, but allows the filters to produce a smoother curve when used in combination. The fact that any conventional analog filter, be it a parametric or graphic equalizer filter, will introduce some degree of phase shift should not be neglected when using such devices. Apart from producing a rapid and substantial change in signal phase, high Q filters also produce a corresponding signal time delay effect. The delay involved can become quite significant at high gain/high Q filter settings. Great care should therefore be taken to introduce the minimum amount of boost or cut in any given situation.

5.2 Interfacing with the Techron TEF 20

The **1905A** can be used as a stand alone equalizer or in conjunction with the TEF 20 and AcoustaEQ software. Used together, they offer the sound engineer a simultaneous display of (1) unequalized sound-system frequency response, (2) the filter electrical response, and (3) the response so far in the equalization. This allows a higher degree of accuracy in the equalization process in much less time than with traditional equalization techniques. The feedback frequency may be more accurately resolved and the notch filter set with even greater precision.

The connections for the TEF 20 interface are found on the back of the unit. See Figure 5. The line-out

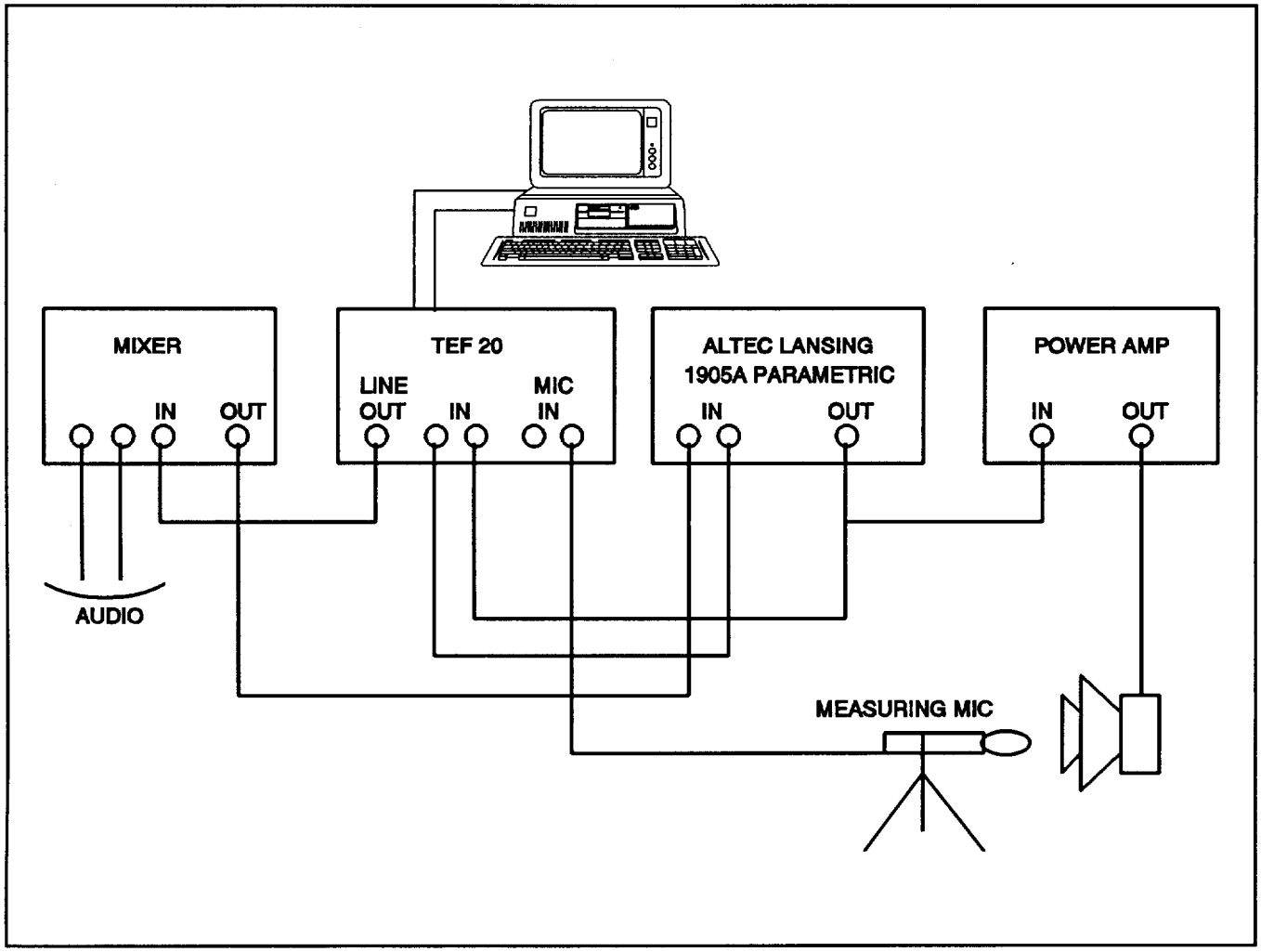

Figure 5 Sample System Connection

from the TEF 20 produces the TEF sweep and is connected to the input of a sound system mixer. The output of the mixer is connected to one of the BNC inputs on the **1905A**. The other BNC input connector on the **1905A** is connected to line-A of the TEF 20. The BNC output connector is connected to the line-in B of the TEF 20.

6 SPECIFICATIONS

Frequency Ranges:
- Coarse: 17 Hz - 130 Hz; 170 Hz - 1.3 kHz; 1.7 kHz - 13 kHz
- Fine: 16.5 Hz - 205 Hz; 165 Hz - 2.05 kHz; 1.65 kHz - 20.56 kHz

Inputs: One
- Type: Balanced (electronically)
- Impedance:
  - Balanced: 20 kΩ
  - Unbalanced: 10 kΩ

Outputs: One
- Type: Balanced
- Min. Load Impedance: 600 Ω
- Source: < 60 Ω
- Maximum Level: +22 dBm

Frequency Response: 20 Hz - 20 kHz, ±1.5 dB

Performance:
- Channel Separation: > 80 dB @ 1 kHz
- Overall Gain: +6 dB
- Overload Indicator: +19 dBu

Maximum Boost/Cut: +15/-25 dB

Bandwidth: Variable from 1/12 - 2 octaves

High-Pass Filter: 15 Hz - 300 Hz, 12 dB/octave

Low-Pass Filter: 2.5 kHz - 30 kHz, 12 dB/octave

Distortion (@ +4 dBm): < 0.01 % @ 1 kHz

Equivalent Input Noise (20 Hz - 20 kHz, unweighted): < -90 dBm

Connections:
- Input: 3 pin XLR female
- Output: 3 pin XLR male
- TEF-20 Interface:
  - Input: Two BNC
  - Outputs: BNC
- Power: 3 pin IEC

Power Requirements:
- Voltage: 110/120/220/240V, 50/60 Hz
- Consumption: < 15 VA

Dimensions:
- Width: 19 inches (482 mm)
- Depth: 9.25 inches (235 mm)
- Height: 3.5 inches (89 mm)

Weight:
- Net: 9.92 lbs (4.5 kg)
- Shipping: 15.44 lbs (7 kg)

Accessories:

- One **1905A** Operating and Service Instructions
- Power cord
- Replacement fuse for 220 Vac line operation

ALTEC LANSING®

1905A

5 BAND PARAMETRIC EQUALIZER

SERVICE INSTRUCTIONS

CAUTION

No user serviceable parts inside. Hazardous voltage and currents may be encountered within the chassis. The service information contained within this document is for use only by ALTEC LANSING'S authorized warranty stations and qualified service personnel. To avoid electric shock, DO NOT perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

7 SERVICE INFORMATION

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NOTE: *Modifications to* ***ALTEC LANSING*** *products are not recommended. Such modifications shall be at the sole expense of the person(s) or company responsible, and any damage resulting therefrom shall not be covered under warranty or otherwise.*

7.1 Parts Ordering

To order replacement parts, look up the ordering number from the parts list and write or call:

ALTEC LANSING Parts Sales
P.O. Box 26105
Oklahoma City, OK 73126-0105
U.S.A.
Phone: (405) 324-5311
FAX: (405) 324-8981

7.2 Factory Service

If factory service is required, ship the unit prepaid to:

ALTEC LANSING Customer
Service/Repair
10500 W. Reno
Oklahoma City, OK 73128 U.S.A.

Enclose a note describing the problem in as much detail as possible. Include other helpful information such as test conditions, where used, how used, etc.

7.3 Technical Assistance

For applications assistance/technical information, write or call:

ALTEC LANSING Technical Assistance
P.O. Box 26105
Oklahoma City, OK 73126-0105
U.S.A.
(405) 324-5311
FAX(405) 324-8981

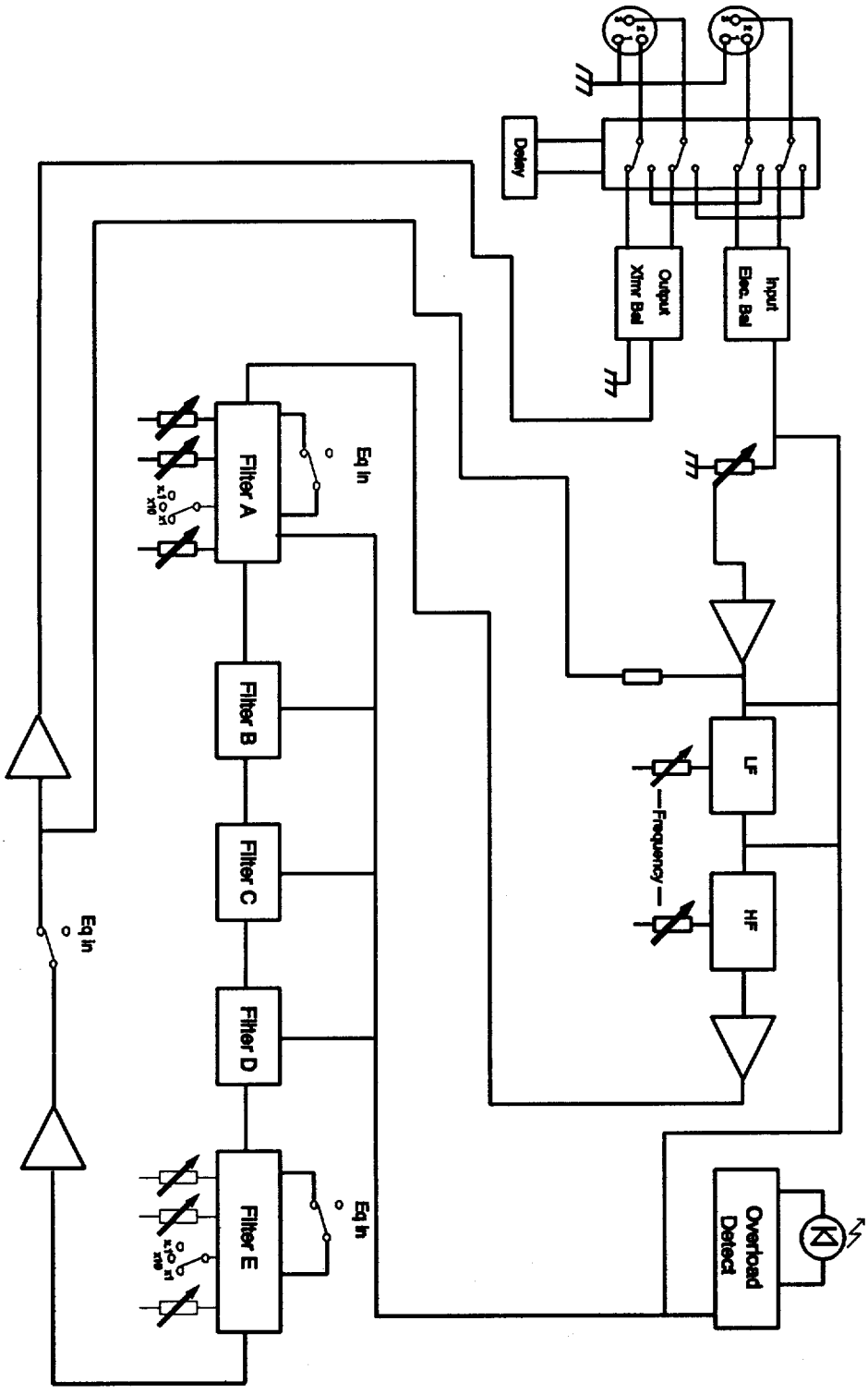

Figure 6 Block Diagram of the 1905A

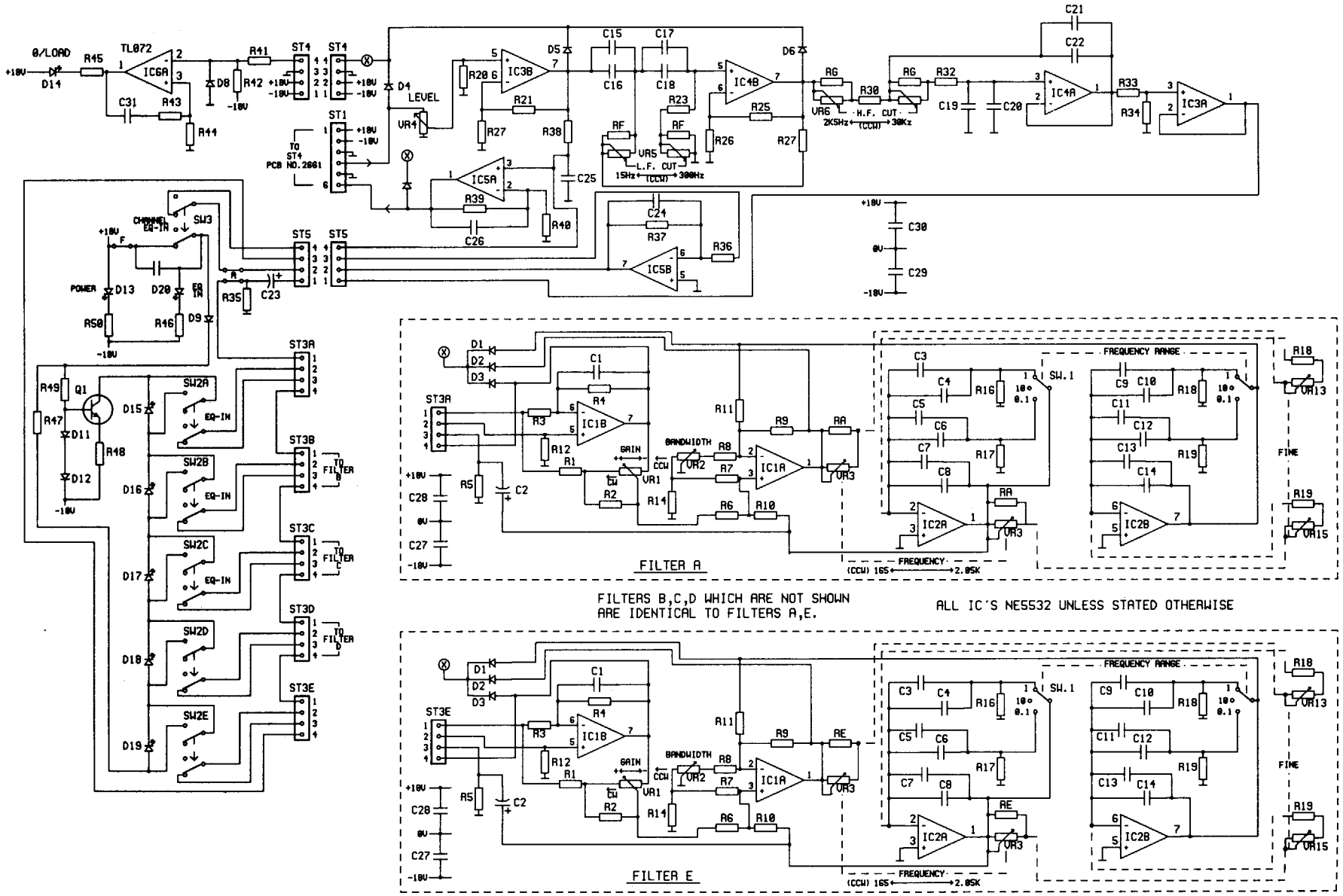

Figure 7 Schematic Diagram for the 1905A Parametric Equalizer (12D012)

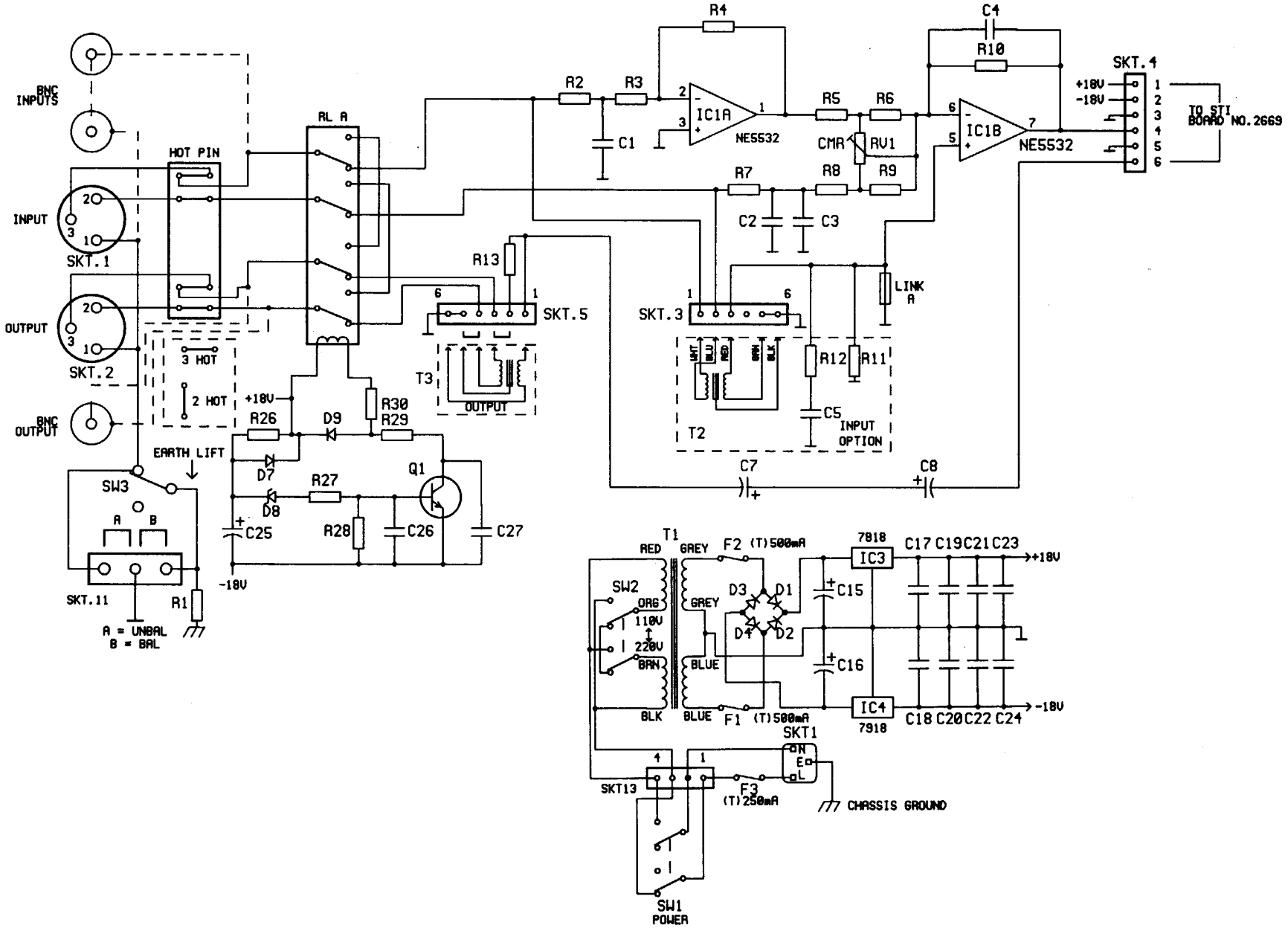

Figure 7 Schematic Diagram for the 1905A Parametric Equalizer (12D012)

Component Parts Listing for the 1905A

Main PCB

Reference Designator	Ordering Number	Name and Description
PC1	E6-02661 (KT)	Main PCB No. 2661
R1	47-01-102114	Resistor, 33kΩ, 0.25 watt, 5%
R2, R7	47-03-121532	Resistor, 1kΩ, 0.25 watt, 1%
R3, R4, R5, R8	47-03-109437	Resistor, 10kΩ, 0.25 watt, 1%
R6, R9	47-01-102078	Resistor, 1kΩ, 0.25 watt, 5%
R10	47-03-028254	Resistor, 11kΩ, 0.25 watt, 1%
R13	47-01-102042	Resistor, 33Ω, 0.25 watt, 5%
R26	47-01-102110	Resistor, 22kΩ, 0.25 watt, 5%
R27	A1-12200 (KT)	Resistor, 2.2kΩ, 0.25 watt, 5%
R28	47-01-102030	Resistor, 10Ω, 0.25 watt, 5%
R29, R30	47-01-102070	Resistor, 470Ω, 0.25 watt. 5%
C1, C2	15-06-037649	Capacitor, 0.001 μF, 2.5% Polypropylene
C3	15-02-029032	Capacitor, 15 pF, Ceramic
C4	B2-10082 (KT)	Capacitor, 82 pF, Ceramic
C6,C7	15-01-026640	Capacitor, 470μF/16V, Aluminum
C15,C16	15-01-037909	Capacitor, 470μF/35V, Aluminum
C17-C24, C26, C27	15-02-108526	Capacitor, 0.047 μF, Ceramic
C25	15-01-028690	Capacitor, 47μF/35V, Aluminum
D1,D4	48-01-037276	Diode, Rectifier,1N4002
D7,D9	48-01-122601	Diode, switching,1N4148
D8	48-01-125098	Zener, 1N4714, 15V/400mW
F1	51-04-100462	Fuse, 250mA/250V, AC line
F2,3	51-04-100463	Fuse, 500mA/250V, Transformer secondaries
IC1	17-01-122832	Linear IC, NE5532A
IC2	17-01-037409	Regulator, 7818, +18V
IC4	17-01-037410	Regulator, 7918, -18V
Q1	D1-C184C (KT)	Transistor, BC194
RLA	E5-R4201 (KT)	Relay, 4 pole, 24 Volt, 2 watt
RVI	47-06-125036	Trimpot, 220Ω, 0.15 watt, CMR
SW2	E1-CF221 (KT)	Slide Switch, 2P2W, Voltage select
T1	E5-TM008 (KT)	Power transformer, torodial
T3	E5-TA007 (KT)	Transformer, balanced output

Reference Designator	Ordering Number	Name and Description

Filter PCB

PC2	E6-02669 (KT)	Filter PCB No.2669
R1	47-01-102062	Resistor, 220Ω, 0.25 watt, 5%
R2,R9,R11,R22,R26,R34	47-01-102092	Resistor, 3.9kΩ, 0.25 watt, 5%
R3,R4	47-01-102094	Resistor, 4.7kΩ, 0.25 watt, 5%
R5,R10	47-01-102106	Resistor, 15kΩ, 0.25 watt, 5%
R6,R12	47-01-102080	Resistor, 1.2kΩ, 0.25 watt, 5%
R7	47-01-102039	Resistor, 24Ω, 0.25 watt, 5%
R8	47-01-102075	Resistor, 750Ω, 0.25 watt, 5%
R18,R19	47-03-122811	Resistor, 787Ω, 0.25 watt, 1%
R14,R21	47-01-102078	Resistor, 1kΩ, 0.25 watt, 5%
R16, R17, R20	47-01-102127	Resistor, 100kΩ, 0.25 watt, 5%
R23,R27	47-01-102068	Resistor, 390Ω, 0.25 watt, 5%
R25,R36-R39	47-01-102086	Resistor, 2.2kΩ, 0.25 watt, 5%
R30,R32	A2-06040 (KT)	Resistor, 604Ω, 0.25 watt, 1%
R33	47-01-102085	Resistor, 2kΩ, 0.25 watt, 5%
R40	47-01-102090	Resistor, 3.3kΩ, 0.25 watt, 5%
C1,C24,C25	15-02-026831	Capacitor, 220pF, Ceramic
C2	15-01-026638	Capacitor, 47μF/16V, Aluminum
C3	B1-20027 (KT)	Capacitor, 0.027μF, Polyester, 5%
C4	B1-20015 (KT)	Capacitor, 0.015μF, Polyester, 5%
C5	B1-20470 (KT)	Capacitor, 0.47μF, Polyester, 5%
C7	15-06-037650	Capacitor, 0.0047μF, Polypropylene, 2%
C9	B1-20180 (KT)	Capacitor, 0.18μF, Polyester, 5%
C11,C12,C15,C17	B1-21000 (KT)	Capacitor, 1μF, Polyester, 5%
C13,C13	15-06-124588	Capacitor, 0.01μF, Polyester, 10%
C16,C18	15-06-124643	Capacitor, 0.33μF, Polyester, 5%
C19	B1-15600 (KT)	Capacitor, 0.0056μF, Polyester, 5%
C21	15-06-038214	Capacitor, 0.012μF, Polyester, 5%
C26	B2-10082 (KT)	Capacitor, 82pF, Ceramic
C27-C30	15-02-108526	Capacitor, 0.047pF, Ceramic
D1-D7	48-01-122601	Diode, switching, 1N4148
IC1-IC5	17-01-122832	IC, NE5532AP, dual Op-amp
ST1, ST2	E2-BP061 (KT)	Connector, MOLEX 6 pin, 0.1 spacing
ST3A-F,ST4,ST5	E2-BP042 (KT)	Connector, MOLEX 4 pin, 0.2 spacing
SW1	E1-AF232 (KT)	Switch, Toggle 2P2T, Rt Angle PCB mount
VR1,VR4	A3-OF022 (KT)	Potentiometer, single,2kΩ linear, 4mm shaft
VR2	A3-PD100 (KT)	Potentiometer, single,10kΩ log, 4mm shaft
VR3,VR5,VR6	A3-TB100 (KT)	Potentiometer, dual,10kΩ analog, 4mm shaft
K1-K18	E4-AP003 (KT)	Knob, Black, 10mm Push on
KC1-KC18	E4-B9006 (KT)	Cap, Grey + Line
VR13, VR15	47-06-038546	Potentiometer, dual, 1 kΩ linear, 20mm shaft

Reference Designator	Ordering Number	Name and Description
		SWITCH PCB
PC3	E6-02670 (KT)	Switch PCB No.2670
R35	47-01-102102	Resistor, 10kΩ, 0.25 watt, 5%
R41	47-01-102127	Resistor, 100kΩ, 0.25 watt, 5%
R42	47-01-109298	Resistor, 180kΩ, 0.25 watt, 5%
R43-R44	47-01-107043	Resistor, 220kΩ, 0.25 watt, 5%
R45	47-01-102086	Resistor, 2.2kΩ, 0.25 watt, 5%
R46	47-01-102280	Resistor, 4.7kΩ, 0.5 watt, 5%
R47	47-01-028544	Resistor, 33Ω, 0.5 watt, 5%
R48	47-01-102054	Resistor, 100Ω, 0.25 watt, 5%
R49	47-01-102102	Resistor, 10kΩ, 0.25 watt, 5%
R50	47-01-102280	Resistor, 4.7kΩ, 0.5 watt, 5%
C23	15-01-028048	Capacitor, 100μF/16V, Aluminum
C31-33	15-02-108526	Capacitor, .047μF/16V, Ceramic
D8-D12	48-01-122601	Diode, 1N4148
D13-D20	D1-AL209 (KT)	LED, Red 3mm round
IC6	17-01-124688	IC, TL072, dual Op-amp
Q1	D1-C184C (KT)	Transistor, NPN BC184
ST4	E2-BP042 (KT)	Connector, MOLEX 4 pin 0.2 spacing
SW2-SW7	E1-BL241 (KT)	Switch, latching-push, 4p2w
		CHASSIS
FH1	E3-A0060 (KT)	Fuse holder, panel PCB mount
FH2, FH3	E3-A0100 (KT)	Fuse holder, open PCB mount
St1	E2-AP034 (KT)	Connector, XLR input, panel mount
St2	E2-AS034 (KT)	Connector, XLR output, panel mount
St3-5	21-02-038451	Connectors, BNC inputs
SW3	E1-CC221 (KT)	Switch, DPDT, earth lift