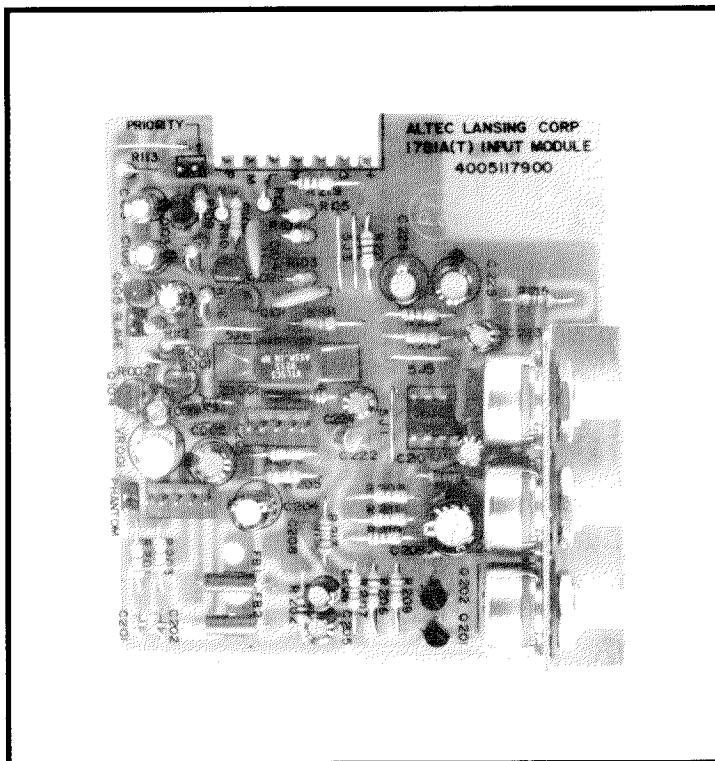




1781A/AT Mic/Line Input Module



DESCRIPTION

The ALTEC LANSING **1781A** programmable input module accepts either mic or line level signals through a wide variety of connector interfaces. Standard features include an electronically balanced input stage with adjustable gain, continuously variable high and low pass filters, RFI protection, 48 volt phantom powering, two levels of muting, and remote control capability. Programming is accomplished with plug-in jumpers which may select phantom power (on or off) and mute priority or slave. Optionally available is the ALTEC LANSING **1785A** input isolation transformer which provides an additional 10 dB of gain for improved sensitivity. ALTEC LANSING also offers the **1781AT**, a programmable input module with a **1785A** transformer installed.

The **1781A/AT** is designed for use with the Altec Lansing **1700C** Mixer/Preamplifier, and **1707C/1715C** Mixer/Amplifiers. Four different input connectors are available: the **1791** Female XLR, **1792** Male XLR, **1793** Dual Phono, and **1794** 5-Lug Terminal Connector.

KEY SPECIFICATIONS

Gain: 0 dB to 50 dB,
continuously variable.
10 dB to 60 dB w/**1785A**.

Input Sensitivity:
(Ref. 1 kHz, 0 dBr = 100 mVrms output, 10 kohm load)
Without **1785A**: 0.3 mVrms to 100 mVrms
(-50 dBr to 0 dBr).
With **1785A**: 0.1 mVrms to 30 mVrms
(-60 dBr or -10 dBr).

Input Impedance: (Ref. 1 kHz)
Electronically balanced: 8 kohm.
Transformer balanced: 600 ohm.
With **1793** installed: 39 kohm.

Frequency Response:
(Ref. 1 kHz, 100 mVrms output, 10 kohm load)
Without **1785A**:
±1 dB (Minimum gain): 20 Hz to 20 kHz.
±1 dB (Maximum gain): 50 Hz to 20 kHz.
With **1785A**:
±1 dB (Minimum gain): 20 Hz to 20 kHz.
±1 dB (Maximum gain): 50 Hz to 15 kHz.

Total Harmonic Distortion (THD):
(Ref. 1 kHz, 100 mVrms output, minimum gain, 10 kohm load, 30 kHz low pass filter)
20 Hz to 20 kHz: <0.05%.

Equivalent Input Noise: <-120 dBr.
(Ref. 0 dBr = 100 mVrms output, 10 kohm load, 200 ohm input termination maximum gain, A-weighted)

High Pass Filter (Low Cut):
(Ref., 100 mVrms output, minimum gain, 10 kohm load)
Fl: 320 Hz (>10 dB at 100 Hz).
Slope: 6 db/oct (20 db/dec).

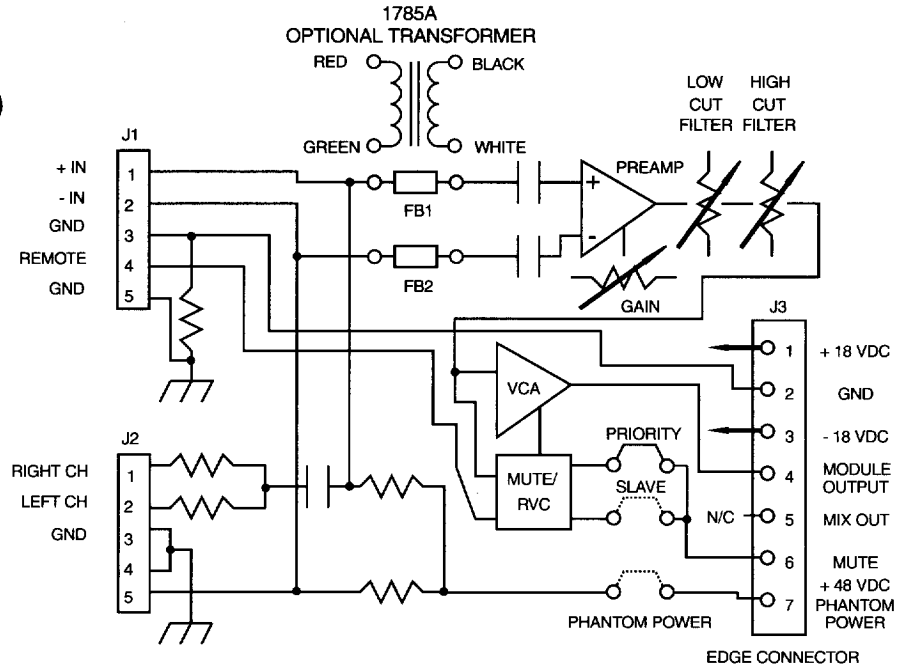
Low Pass Filter (High Cut):
(Ref. 100 mVrms output, minimum gain, 10 kohm load)
Fh: 5 kHz (>6 dB at 10 kHz).
Slope: 6 dB/oct (20 dB/dec).

Attenuation:
(Ref. 1 kHz, 100 mVrms output, 10 kohm load)
Mute: >60 dB.
10 kohm remote

1785A SPECIFICATIONS

- Voltage Gain:** 10 dB.
- Impedance Ratio:** 600 ohm : 10 kohm.
(Primary: Secondary)
- Frequency Response:**
(Ref. 1 kHz, 100 mVrms output)
±1 dB: 50 Hz to 15 kHz.
- Total Harmonic Distortion (THD):**
(Ref. 1 kHz, 100 mVrms output)
50 Hz to 20 kHz: <0.2%.
- Insertion Loss:** <1 dB.
(Ref. 1 kHz, 100 mVrms output)
- Included Accessories:**
2 - Mounting screws.
1 - Flat washer.

BLOCK DIAGRAM



ARCHITECT'S and ENGINEER'S SPECIFICATIONS

The input preamplifier modules shall have phantom power capability, continuously variable high and low pass filters, adjustable gain, and L + R stereo summing. A second model shall also feature a 600 ohm input transformer. In addition, the modules shall be fully compatible with the 1700-series mixer/preamplifier and mixer/amplifier mainframes, and accept any one of the 1790-series input connectors.

The input preamplifier modules shall meet the following performance criteria: Gain: 50 dB (60 dB w/1785A Input Transformer), continuously variable.

Frequency Response: 50 Hz to 20 kHz, ±1 dB.
Equivalent Input Noise: <120 dB below rated output voltage with a 200 ohm input termination. Total Harmonic Distortion (THD): <0.05%, 20 Hz to 20 kHz (1781A) or <0.2%, 50 Hz to 15 kHz (1781AT) at minimum gain. High Pass Filter Corner Frequency: 320 Hz. Low Pass Filter Corner Frequency: 5 kHz. High and Low Pass Filter Slope: 6 dB per octave.

The input preamplifier shall be the Altec Lansing model 1781A or 1781AT.



a MARK IV company

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the sound of experience.

1781A

Mic/Line Input Module

Operating and Service Instructions



ALTEC LANSING CORPORATION

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VOX GATE

DESCRIPTION

VOX GATE. The ALTEC LANSING 1781A programmable input module can be modified to become a current controlled gate with a adjustable threshold. There are two applicable modifications, A and B. The A modification will stand alone (gated only by its input). The B modification will be gated by the external mute, and/or other B modified modules.

The advantages to using the **VOX GATE** modification is to reduce or eliminate noise on open microphone lines. The **VOX GATE** suppresses extraneous noise from entering mixer inputs from open microphone lines or from inactive microphones. This results in increased quietness of sound systems of all sizes. After installation of the **Vox Gate** modification a 1781A or 1781AT will operate within all of the original specifications.

Table V. Threshold Sensitivity
Resistive Value Reference: 1 kHz, 1781A (-18 dBu = 0 dBr In, Linkout 100 mVrms 10 kΩ Load). 1781AT (-28 dBu = 0 dBr In, Linkout 100 mVrms 10 kΩ Load).

Threshold Sensitivity dBr ± 1 dB	R101 Value in Ohms ± 1%
21.50 dBr	4.99 kΩ
17.75 dBr	10.0 kΩ
13.25 dBr	20.0 kΩ
10.25 dBr	30.1 kΩ
8.00 dBr	40.2 kΩ
6.25 dBr	49.9 kΩ

The **A** modification consist of (referring to figure 7):

1. Remove capacitor C001 (47 μF) and C002 (.01 μf).
2. Remove resistor R101 (47 kΩ).
3. Remove resistor R113 (10 kΩ)
4. Connect a resistor from the junction of C102/R101 and the junction of C224 (negative side) and MCL703C (resistor value will depend on the required threshold, from 5 kΩ to 50 kΩ, refer to Figure 7 and Table V).
5. Place a jumper trace across transistors Q103 and Q105 (PNP 2SC1815Y) collectors.
6. Priority jumper must be removed.

The **B** modification consist of (referring to figure 7):

1. Remove capacitor C001 (47 μf) and C002 (.01 μf).
2. Remove resistor R101 (47 kΩ).
3. Remove resistor R113 (10 kΩ).
4. Connect a resistor from the junction of C102/R101 and the junction of C224 (negative side) and MCL703C (resistor value will depend on the required threshold, from 5 kΩ to 50 kΩ, refer to Figure 7 and Table V).
5. Place a jumper trace across transistors Q103 and Q105 (PNP 2SC1815Y) collectors.
6. Priority jumper must be in place.

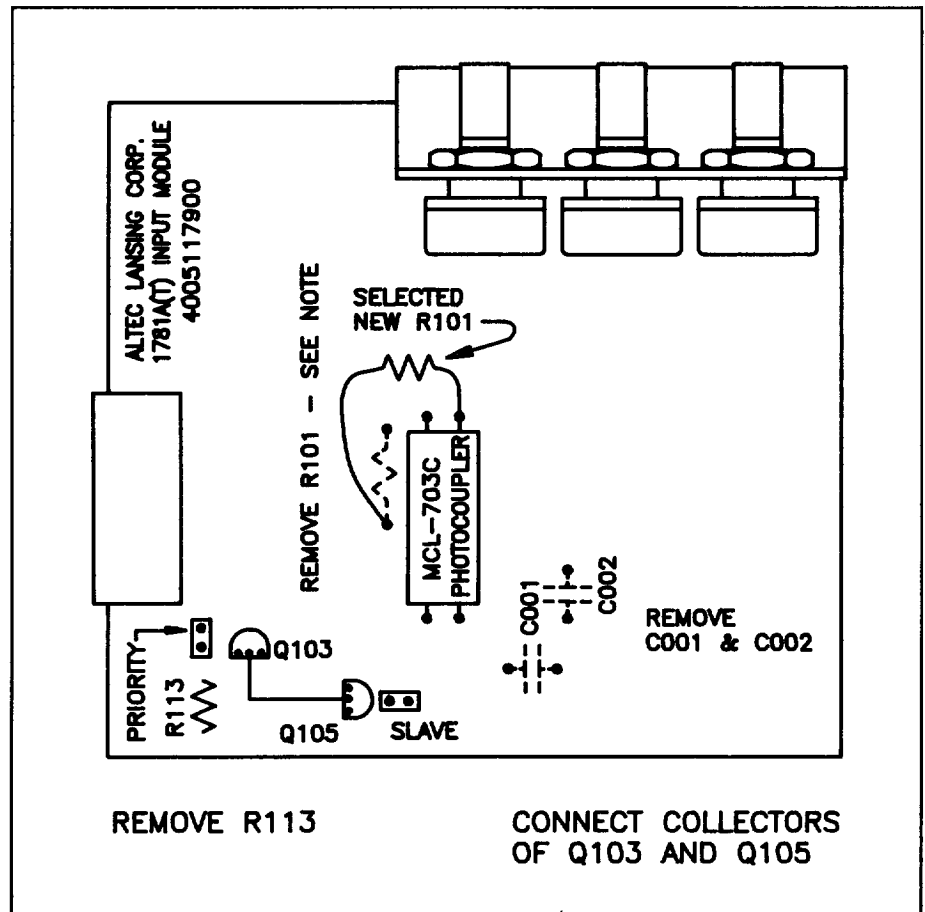


Figure 7. Optional VOX GATE Modification Layout

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1 DESCRIPTION

The ALTEC LANSING 1781A programmable input module accepts either mic or line level signals through a wide variety of connector interfaces. Standard features include an electronically balanced input stage with adjustable gain, continuously variable high and low pass filters, RFI protection, 36 volt phantom powering two levels of muting, and remote control capability. Programming is accomplished with plug-in jumpers which may select phantom power (on or off), mute priority or slave, or remote volume control. Optionally available is the ALTEC LANSING 1785A input isolation transformer which provides an additional 10 dB of gain for improved sensitivity. ALTEC LANSING also offers the 1781AT, a programmable input module with a 1785A Transformer installed.

2 INSTALLATION OF OPTIONAL 1785A INPUT ISOLATION TRANSFORMER

1. Remove the two wire jumpers with ferrite beads, designated FB1 and FB2, near the upper right corner of the module when looking at the component side of the circuit board. Refer to Figure 1 for details.

2. Thread the four wires from the transformer through the larger center hole from the component side. Secure the transformer with the two screws and washers provided.
3. Lay the module on the component side (circuit side up) and attach the four wires as shown in Figure 2.

3 CONFIGURING THE 1781A

A block diagram of the 1781A input module is shown in Figure 3. Study the diagram carefully and refer to it as needed.

3.1 Programming the 1781A

3.1.1 Mute "Priority" Mode of Operation

In the priority mode, a signal applied to the designated priority channel will cause all other input channels configured in the slave mode to be fully attenuated.

To configure an input module for the priority mode, install a 2-pin female jumper onto J4, the 2-pin male header connector located near the lower right corner of the module as shown in Figure 1.

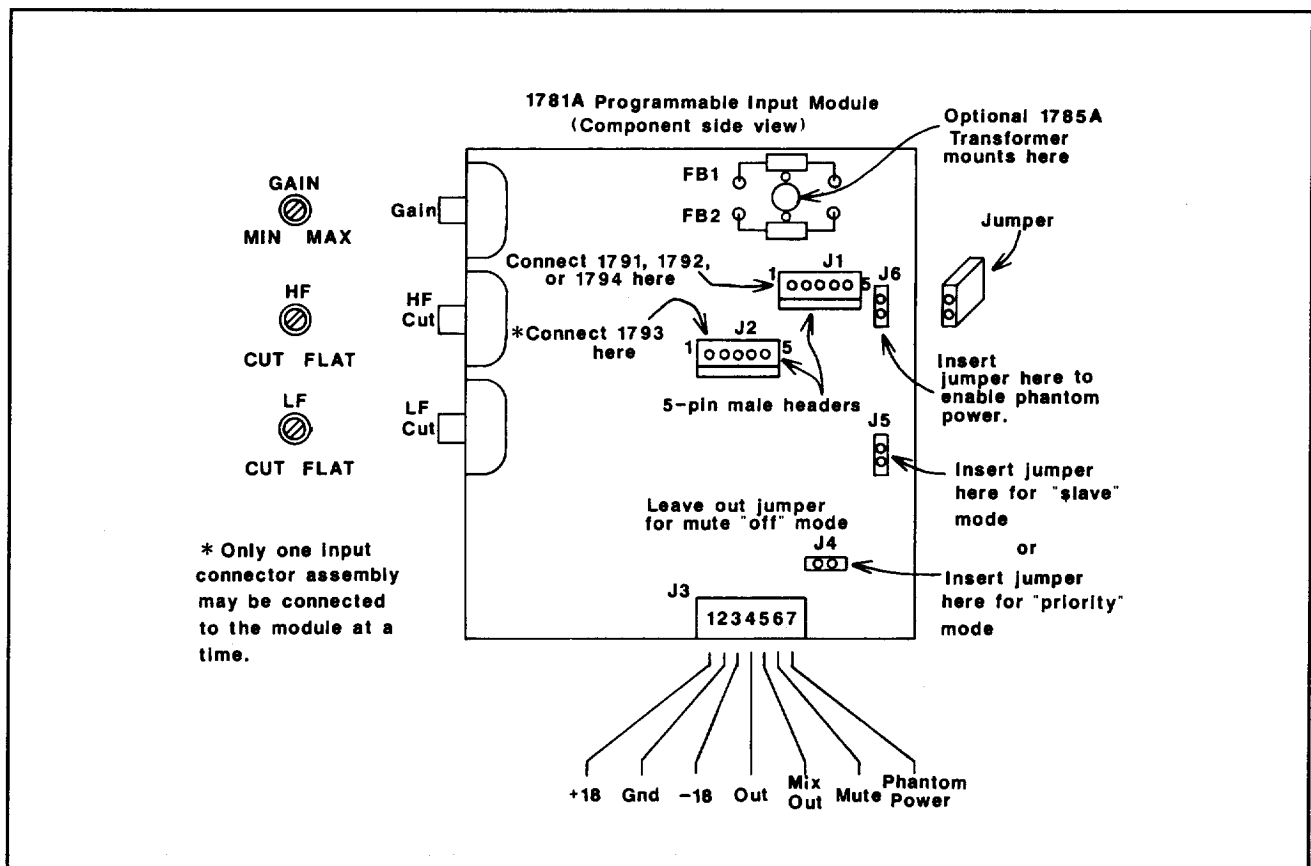


Figure 1 Optional 1781A Configuration

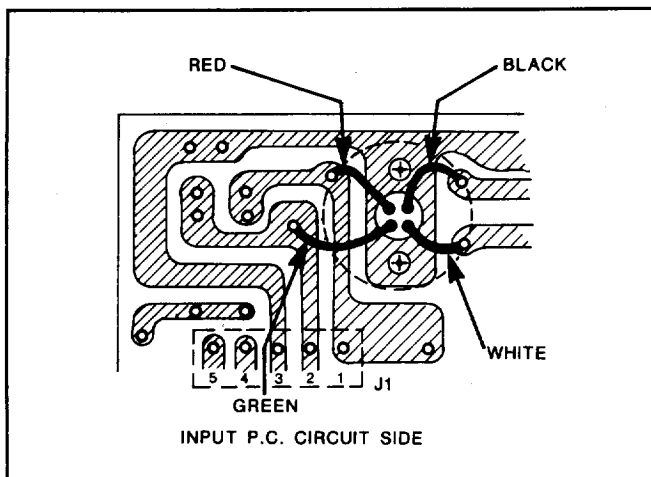


Figure 2 1785A Input Transformer Connections

Any number of channels can be configured in the priority mode, however, activity in one priority channel will not attenuate the other priority channels.

3.1.2. Mute "Slave" Mode of Operation

In the slave mode, a module (or all slave

modules) will be fully attenuated either during activity in the priority channel, switch closure between the MUTE and COM (common) terminals of the 7-lug screw terminal connector located on the rear of the mainframe, or a switch closure between the common and any one of the tone generator control inputs (for the duration of the tone).

To configure the module for the slave mode, install a 2-pin female connector onto J5, the 2-pin male header connector located near the right edge of the module as shown in Figure 1.

3.1.3 Mute "Off" Mode of Operation

By not installing a jumper in either the priority (J4) or slave (J5) position, the channel can not be muted, or cannot mute other channels.

3.2 Phantom Power

To enable phantom powering of condenser microphones, install a 2-pin female jumper onto J6, the 2-pin male header connector located near J1 as shown in Figure 1. This will apply +36 VDC to each side ("+" and "-") of the microphone's signal lines.

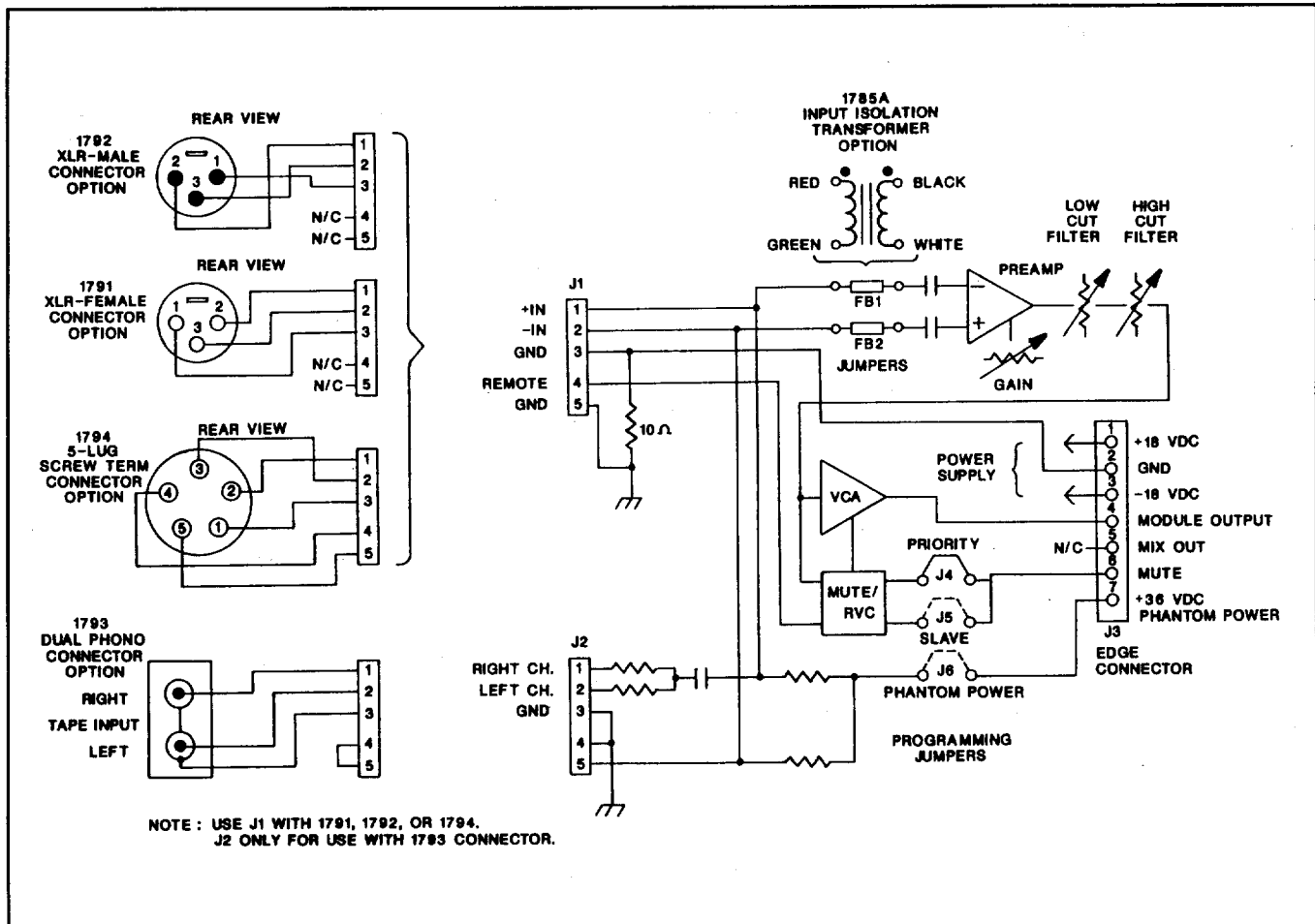


Figure 3 Block Diagram of the 1781A Input Module

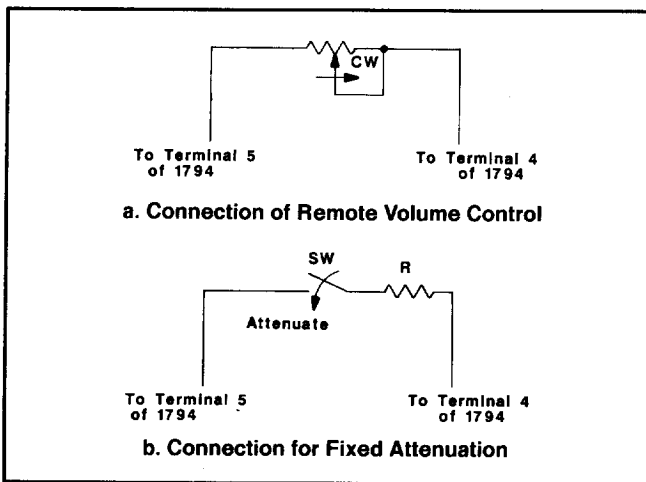


Figure 4 Remote Volume Control Applications

3.3 Remote Volume Control Configurations

3.3.1 Remote Volume Control Connections

A remote volume control (RVC) may be used with the 1794 5-lug screw terminal connector assembly to vary the output level of the input module. The resistance setting of a potentiometer determines the amount of attenuation in the voltage-controlled attenuator (VCA). Since only DC is present on the potentiometer (no audio signal), the pot may be located long distances from the mainframe. The RVC function is usable regardless of the mute circuit's mode of operation.

To implement a remote volume control, connect an audio taper potentiometer (10 kohm or greater) between pins 4 and 5 of the 1794. Refer to Figure 4a.

3.3.2 Alternative Configurations Using the RVC Circuitry for Preset Attenuation

A variation of the remote volume control is shown in Figure 4b. A switch in series with a fixed value resistor "R" may be used to attenuate (or mute) the channel to a predetermined level. If the resistor is removed and replaced with a zero ohm jumper, a switch closure will fully attenuate the channel. Table I shows typical attenuation values expected for various values of resistor "R".

NOTE: VR001 (located near J1) calibrated for 60 dB of attenuation, with pins 4 & 5 of the 1794 shorted.

3.3.3 Simultaneous Remote Volume Control of Several Input Modules

It is possible to parallel pins 4 and 5 of several 1794 5-lug screw terminal connectors to

permit one potentiometer (connected between the pins 4 and 5) to control the modules simultaneously. This technique works reasonably well with an audio taper potentiometer 10 kΩ or greater). To insure that the channels track through out the range of attenuation, each module's attenuation-adjust potentiometer, VR001, should be adjusted for the same maximum attenuation.

Table I Resistance Table for Fixed Attenuation

Amount of Attenuation (±2 dB Typ.)	Approximate Value of R (¼ w)	
	1%	5%
10 dB	2.80 kΩ	2.7 kΩ
20 dB	1.50 kΩ	1.5 kΩ
30 dB	887 Ω	910 Ω
40 dB	511 Ω	510 Ω
50 dB	191 Ω	200 Ω
60 dB	0 Ω	0 Ω

3.4 Connector Options for the 1781A

The 1781A programmable input module has two 5-pin male header connectors (J1 and J2) which are used to interface the 1790-series of connector assemblies. Due to circuit differences between a balanced mic input ("+" and "-") and a tape input (L and R), use J1 with the 1791, 1792, or 1794. Connector J2 should only be used with the 1793 dual phono connector. Please refer to Figures 1 and 3 for additional information.

NOTE: When using the 1793 dual phono connector assembly, insure that the phantom power jumper is removed from J6.

The pinouts of the connectors are shown in Table II. Figure 5 shows how external equipment may be connected to the 1781 A through the various connector choices.

Table II Connector Assembly Wiring

Pin No.	1791 XLR-F	1792 XLR-M	1794 5-lug screw term.
1	Gnd (Shield)	Gnd (Shield)	Gnd (Shield)
2	+ in (Hi)	+ in (Hi)	+ in (Hi)
3	- in (Lo)	- in (Lo)	- in (Lo)
4	Shell (Chas)	Shell (Chas)	RVC
5	N/A	N/A	RVC Gnd

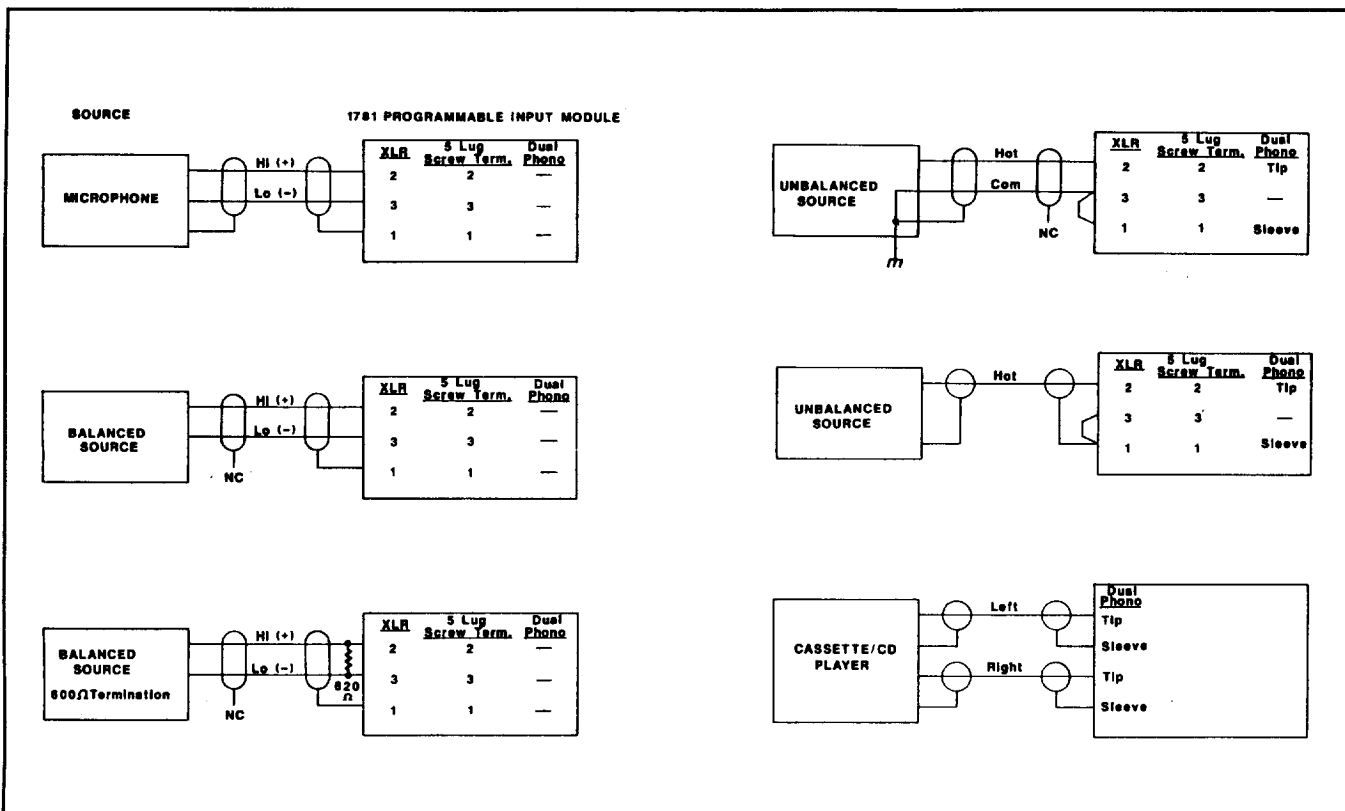


Figure 5 Typical Input Module Connections

NOTE: Only one input connector assembly may be used with the 1781A programmable input module at a time.

3.5 Use of High Line Level Input Signal switch the 1781A

The sensitivity of the electronically balanced input stage at minimum gain is approximately 100 mVrms (30 mVrms with 1785A installed). Therefore it may be necessary to pad the incoming line if its nominal level exceeds -18 dBu (≈ 100 mVrms), or -28 dBu (30 mVrms) when using the 1785A. Refer to Table IV for a suggested pad and the required attenuation for various input levels.

3.5.1 Alternatives to the External Resistive Pad

If the 1785A input isolation transformer is not used, the ferrite beads, FB1 and FB2, can be replaced by resistors. For example, replacing the ferrite beads with 91 kΩ resistors will reduce the sensitivity by nearly 20 times (at minimum gain) enabling a nominal level of +8 dBu (1.95 Vrms) to produce rated output from the module (100 mVrms). Refer to Table III for the approximate resistor values required for other input levels.

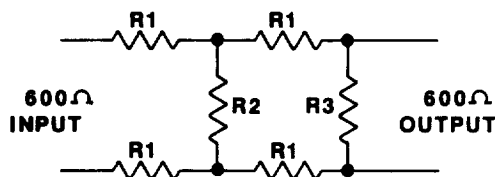
Table III Resistor Replacements for FB1 & FB2 to Reduce Sensitivity of 1781A

Nominal Input Level (dbu)	Replace FB1 & FB2 with values below
+8	91 kΩ
+2	47 kΩ
-2	30 kΩ
-6	5.1 kΩ
-10	4.3 Ω

If the 1785A input isolation transformer is used, it is also possible to select a resistor from Table IV and connect it between pins 4 and 5 of the 1794 5-lug screw terminal connector (or directly to J1-4 and J1-5 on the printed circuit board). This technique works by increasing the attenuation in the VCA. It should not, however, be used on input signal levels above -2 dBu. With higher levels (requiring more attenuation in the VCA), the distortion through the VCA increases. Therefore, if the application requires that the input module handle nominal line levels in excess of -2 dBu (when using the 1785A transformer), the external resistive pad offers the best performance.

Table IV Attenuator Pad Resistance Values

		Electronically Balanced Input Resistor Values for Pad (in ohms)					
Signal Level	Amount of Attenuation	R1		R2		R3	
		1%	5%	1%	5%	1%	5%
-18 dBu	None	---	---	---	---	---	---
-8 dBu	10 dB	154	150	422	430	604	620
-4 dBu	14 dB	200	200	249	240	604	620
0 dBu	18 dB	232	240	154	150	604	620
+10 dBu	28 dB	274	270	47.5	47	604	620
		Electronically Balanced Input (1785A) Resistor Values for Pad (in ohms)					
Signal Level	Amount of Attenuation	R1		R2		R3	
		1%	5%	1%	5%	1%	5%
-28 dBu	None	---	---	---	---	---	---
-18 dBu	10 dB	154	150	422	430	604	620
-8 dBu	20 dB	243	240	121	120	604	620
-4 dBu	24 dB	261	270	75	75	604	620
0 dBu	28 dB	274	270	47.5	47	604	620
+10 dBu	38 dB	294	300	15	15	604	620



$$R1 = 300 \frac{(\sqrt{N} - 1)}{(\sqrt{N} + 1)} \Omega$$

$$R2 = 1200 \left(\frac{\sqrt{N}}{N - 1} \right) \Omega$$

$$R3 = 600 \Omega$$

Where $N = 10^{\frac{(\text{Loss in dB})}{10}}$

4 SPECIFICATIONS

1781A PROGRAMMABLE INPUT MODULE

Gain: 0 dB to 50 dB, continuously variable
10 dB to 60 dB w/1785A

Input Sensitivity:

(Ref. 1 kHz, 0 dBr = 100 mVrms output, 10 k Ω load)

Without 1785A: 0.3 mVrms to 100 mVrms
(-50 dBr to 0 dBr)

With 1785A: 0.1 mVrms to 30 mVrms
(-60 dBr or -10 dBr)

Input Impedance: (Ref. 1 kHz)

Electronically balanced: >8 k Ω

Transformer balanced: 200 Ω to 600 Ω

With 1793 installed: >39 k Ω

Frequency Response:

(Ref. 1 kHz, 100 mVrms output, 10 k Ω load)

Without 1785A:

± 1 dB (Minimum gain): 20 Hz to 40 kHz

± 1 dB (Maximum gain): 50 Hz to 40 kHz

± 3 dB (Minimum gain): 10 Hz to 80 kHz

± 3 dB (Maximum gain): 25 Hz to 80 kHz

With 1785A:

± 1 dB (Minimum gain): 20 Hz to 25 kHz

± 1 dB (Maximum gain): 40 Hz to 15 kHz

± 3 dB (Minimum gain): 10 Hz to 50 kHz

± 3 dB (Maximum gain): 20 Hz to 30 kHz

Total Harmonic Distortion (THD):

(Ref. 1 kHz, 100 mVrms output, minimum gain, 10 k Ω load, 30 kHz low pass filter)

20 Hz to 20 kHz: <0.03%

Equivalent Input Noise: <-120 dBr

(Ref. 0 dBr = 100 mVrms output, 10 k Ω load, 200 Ω input termination maximum gain, A-weighted)

High Pass Filter (Low Cut):

(Ref., 100 mVrms output, minimum gain, 10 k Ω load)

F_l: 320 Hz (>10 dB at 100 Hz)

Slope: 6 dB/oct (20 dB/dec)

Low Pass Filter (High Cut):

(Ref. 100 mVrms output, minimum gain, 10 k Ω load)

F_h: 5 kHz (>6 dB at 10 kHz)

Slope: 6 dB/oct (20 dB/dec)

Attenuation:

(Ref. 1 kHz, 100 mVrms output, 10 k Ω load)

Mute: >60 dB

10 k Ω remote

Optional Accessories:

1785A Input Isolation Transformer

1785A INPUT ISOLATION TRANSFORMER

Voltage Gain: 10 dB

Impedance Ratio: 600 Ω : 10 k Ω
(Primary: Secondary)

Frequency Response (Ref. 1 kHz, 100 mVrms output)

± 1 dB: 40 Hz to 20 kHz

± 3 dB: 20 Hz to 40 kHz

Total Harmonic Distortion (THD):

(Ref. 1 kHz, 100 mVrms output)

50 Hz - 20 kHz: <0.2%

Insertion Loss: <1 dB

(Ref. 1 kHz, 100 mVrms output)

Included Accessories:

2 - Mounting screws

1 - Flat washer

5 SERVICE INFORMATION

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.

5.1 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

5.2 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.

5.3 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.
Phone: (405) 324-5311
FAX: (405) 324-8981

5.4 1781A Maximum Mute/Attenuation Level Adjustment

(Requires AC voltmeter and sinewave oscillator)

The schematic drawing of the 1781A Programmable Input Module is shown in Figure 6. Refer to it as needed.

1. Turn Power off. Rotate the MASTER level control fully counterclockwise to the "-" position.
2. Install a 1781A input module in the main-

frame. Locate trimpot VR001 on the 1781A printed circuit board. Make sure there is enough room in the mainframe to adjust VR001. Connect a 10 k Ω potentiometer to pins 4 and 5 of the 1794 5-lug connector as shown in Figure 4a and connect the pigtail of the 1794 to J1 on the module. Rotate the gain control on the module to minimum and the 10 k Ω remote volume pot fully clockwise. Rotate input level control corresponding to the input channel location of 1781A to maximum.

3. Connect the output of the signal generator to the input connector assembly plugged-in to the module. Set the generator to 1 kHz and approximately 100 mVrms output. Connect an AC voltmeter to the PREAMP OUT phono connector on the rear of the mainframe.
4. Apply power and adjust the output of the signal generator for a 0 dBu (0.775 Vrms) reading on AC voltmeter. Rotate the remote volume control to the full counterclockwise position. Adjust VR001 for -60 dB reading on the voltmeter. When set, this is the amount of attenuation that will occur when the module is muted.

Operating and Service Instructions for the Altec Lansing 1781 Mic/Line Input Module

3. VALUES IN () DENOTE ORIGINAL COMPONENT VALUES FOR 1781 AND 1785.
 2. USE 1785 WITH 1781, AND 1785A WITH 1781A; DO NOT MIX "A" AND NON-"A" COMPONENTS.
 1. PIN 1 OF J3 TOWARDS REAR OF MAINFRAME.
- NOTES: UNLESS OTHERWISE SPECIFIED

Q201, Q202 - 2N5087
 Q001, Q101 - Q105 - 2N3904
 IC201 - RC4558
 ZD001 - 8.2V ZENER

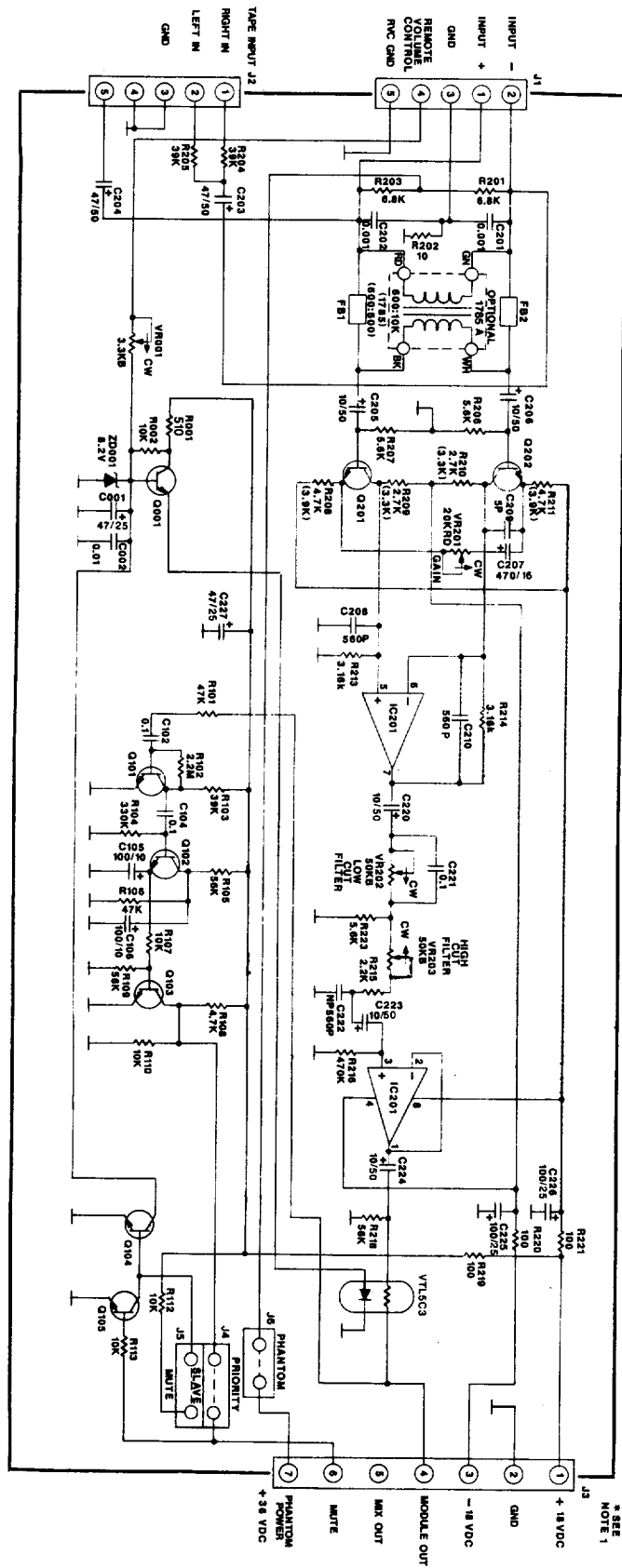
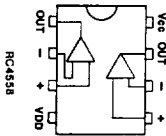


Figure 6 Schematic of the 1781A/AT (11C144)

Component Parts Listing

Reference Designator	Ordering Number	Description
C001, 227	15-01-026638	Capacitor, 47 μ F, 25V
C225, 226	15-01-026639	Capacitor, 100 μ F 25V
C207	15-01-026640	Capacitor, 470 μ F 16V
C203, 204	15-01-026641	Capacitor, 47 μ F, 50V
C105, 106	15-01-108605	Capacitor, 100 μ F 10V
C205, 206, 220, 223, 224	15-01-124502	Capacitor, 10 μ F 50V
C209	15-02-026625	Capacitor, 5 μ f, 50V
C201, 202	15-02-026629	Capacitor, .001 μ F, 50V
C208, 210	15-02-026631	Capacitor, 560 pF, 50V
C002	15-02-100307	Capacitor, .01 μ F, 100V
C102, 104	15-02-124808	Capacitor, 1 μ F, 100V
C221	15-06-124637	Capacitor, 1 μ F, 100V
IC201	17-01-122955	Dual Op Amp, RC4558
RT101	37-02-121322	Opto-Cell ^A
R202	47-01-102030	Resistor, 100, 5%
R219, 220, 221	47-01-102054	Resistor, 100 Ω , 5%
R001	47-01-102071	Resistor, 510 Ω 5%
R213, 214	47-03-121329	Resistor, 3.16 k Ω , 1%
R215	47-01-102086	Resistor, 2.2 k Ω , 5%
R209, 210	47-01-102088	Resistor, 2.7 k Ω , 5%
R108, 208, 211	47-01-102094	Resistor, 4.7 k Ω , 5%
R206, 207, 223	47-01-102096	Resistor, 5.6 k Ω , 5%
R201, 203	47-01-102098	Resistor, 6.8 k Ω , 5%
R002, 107, 110	47-01-102102	Resistor, 10 k Ω , 5%
R103, 112, 113, 204, 205	47-01-102116	Resistor, 39 k Ω , 5%
R101, 106	47-01-102119	Resistor, 47 k Ω , 5%
R105, 109, 218	47-01-102121	Resistor, 56 k Ω , 5%
R104	47-01-104541	Resistor, 330 k Ω , 5%
R216	47-01-109204	Resistor, 470 k Ω , 5%
R102	47-01-113167	Resistor, 2.2 M Ω , 5%
VR201	47-06-026626	Reverse Log Pot, 20 k Ω
VR202, 203	47-06-026627	Linear Pot, 50 k Ω
VR001	47-06-026637	Trim Pot, 4.7 k Ω
Z0001	48-01-026636	Zener Diode, 8.2V
Q201, 202	48-03-026635	Transistor, PNP 2N5087 ^B
Q001, 101, 102, 103, 104, 105	48-03-121306	Transistor, NPN, 2N3904
FB1, FB2	56-01-124563	Ferrite Bead
	21-01-124465	2 Position jumper
	28-01-124701	4-40 x 1/4" Rolox Ser.
	14-08-026632	Bracket, Pot Mounting
J1, J2	21-01-026622	5 Pin Header
J4, J5, J6	21-01-026654	2 Pin Header
J3	21-01-026623	7 Pin Connector

Note: All Resistors 1/4W

Notes Regarding Parts Listing

- A. If RVC operation is desired, verify the type of photo-coupler installed on the 1781A(T) module(s). (The photo-coupler is located just below J2 with the component side facing you, and the Gain, HF cut, and LF cut potentiometer facing left). If the photo-coupler is a Moririca MCL-703C (as listed in the schematic), then the RVC configurations previously mentioned are correct. However, if the photo-coupler is a Vactec VTL5C3, or if the MCL-703C is replaced with a Vactec VTL5C3, then a 1 kohm audio taper (preferred) or a 1 kohm linear potentiometer must be used (instead of the 10 kohm potentiometer listed previously). Also, Table I should be replaced with Table V.

**Table V Resistance Table for Fixed Attenuation
(using Vactec VTL5C3)**

Amount of Attenuation (± 2 dB Typ.)	Approximate Value for R ($\frac{1}{4}$ w)	
	1%	5%
10 dB	309 Ω	330 Ω
20 dB	215 Ω	220 Ω
30 dB	107 Ω	110 Ω
40 dB	68.1 Ω	68 Ω
50 dB	35.7 Ω	36 Ω
60 dB	0 Ω (VR001 Cal.)	0 Ω

- B. Normally, Q1 and Q2 are Toshiba 2SA970 low noise transistors. Their pinout, unlike most American devices, is E-C-B (emitter-collector-base). Frequently, Motorola 2N5087 (P/N 48-03-026635) low noise transistors are substituted and offer equivalent, if not improved, performance. However, their pinout is E-B-C. If replacements are ever necessary, always order a matched pair of devices, e.g. do not mix the American and Japanese parts on the same circuit board. Use either two Japanese or two American devices and pay close attention to their pinouts during installation.



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