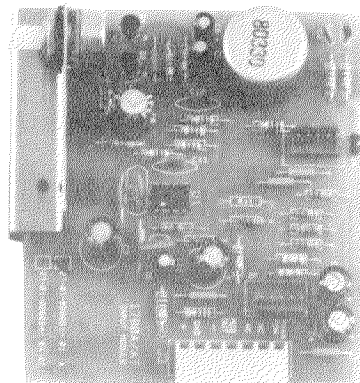
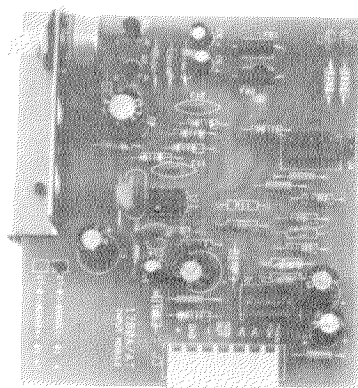




1780A AND 1780AT MIC/LINE INPUT MODULE



DESCRIPTION

The ALTEC LANSING **1780A** and **1780AT** Mic/Line input modules combine basic microphone preamplification with true line level input capability. Each module has a built-in resistive pad to permit levels in excess of +10 dBm and their high input impedance easily allows sixteen modules to be driven from a single low impedance source. In addition, both modules have a 300 Hz high pass filter, phantom power capability, L + R stereo

summing, and from 0 to 50 dB of continuously variable gain. They are 100% compatible with all 1700-series mainframes and accept any one of the 1790-series connectors. The AT-version includes a 10 k Ω input bridging transformer for those who prefer transformer isolation. Unlike the 1781A, neither has muting (priority or slave), remote volume control capability, or continuously-variable high and low cut filters.

SPECIFICATIONS

(Reference 0 dBu = 0.775 v rms)

Gain: 0 dB - 50 dB, continuously variable

Input Sensitivity:
Without pad -58 dBu to -8 dBu
(1 mv rms to 312 mv rms)
With pad -38 dBu to +12 dBu
(10 mv rms to 3.12 v rms)

Input Impedance:
1780A 10 k Ω
1780AT 10 k Ω
With **1793**
Dual Phono 40 k Ω

Frequency Response:
50 Hz - 20 kHz, ± 1 dB
25 Hz - 40 kHz, ± 3 dB

Total Harmonic Distortion:
(Ref. minimum gain, 50 Hz - 20 kHz measurement bandwidth, 30 kHz low pass filter)
1780A < 0.01%
1780AT < 0.025%

Equivalent Input

Noise: < -120 dB
(Ref. 0 dB = 100 mv rms output, 10 k Ω load, 200 input termination, maximum gain, A-weighted)

High Pass Filter:

Corner frequency: 300 Hz
Slope: 12 dB/octave

Controls: 1 - Gain, continuously variable

Weight (Net):

1780A 2.5 oz. (70 gr)
1780AT 3.0 oz. (85 gr)

Power Supply

Requirements: ± 18 VDC at 15 ma DC
(Supplied by mainframe)

Included

Accessories: 1 - 2-pin female jumper
(for phantom power)
2 - mounting screws
(for potentiometer bracket)
1 - Operating Instructions

OPERATING INSTRUCTIONS

CONFIGURING THE 1780A

A block diagram of the 1780A and 1780AT is shown in Figure 1. Study the block diagram carefully and refer to it as needed.

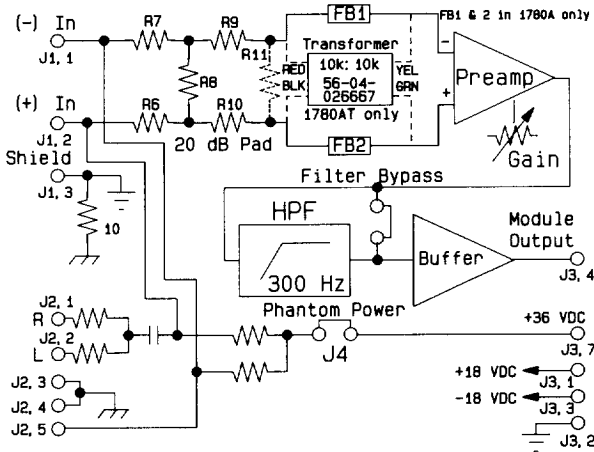


Figure 1. Block Diagram of the 1780A and 1780AT Mic/Line Input Module

PHANTOM POWER

To enable phantom powering of condenser microphones, install a 2-pin female jumper onto J4, the 2-pin male header connector located adjacent to J1 as shown in Figure 2 below. This will apply +36 VDC to each side ("+" and "-") of the microphone's signal lines.

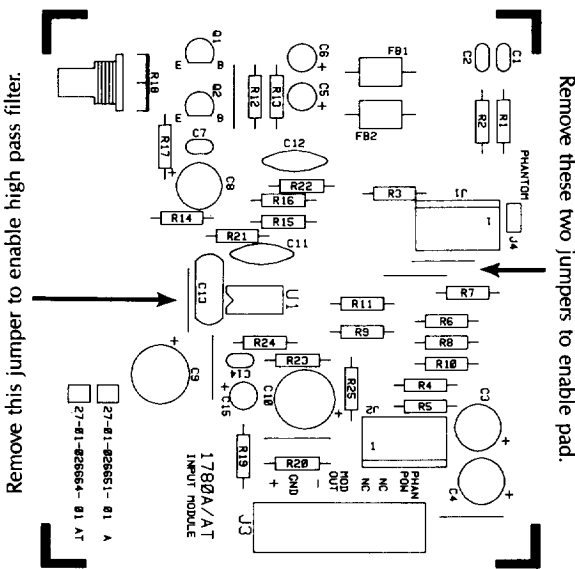


Figure 2. Component Location for the 1780A PCB

When phantom power is not needed, the jumper should not be used.

RESISTIVE PAD

A 10 kΩ, 20 dB resistive pad is pre-installed on the printed circuit board but is bypassed by two jumpers as shown in the schematic and in Figure 2. If the pad is not needed, resistor R8 should be removed from the circuit board. This will maintain a high input impedance by minimizing the

loading effects caused by R8. Follow the instructions below for the desired configuration.

To ENABLE the resistive pad, clip the two zero-ohm wire jumpers located between connector J1 and resistor R7 (and re-install resistor R8 if it was previously removed).

To DISABLE the resistive pad, clip resistor R8 from the circuit board (and re-install the two wire jumpers if they were previously removed).

Resistor R11 is not used in this design (and omitted from the PCB) since the circuit's differential impedance is already 10 kΩ. It may, however, be used in other pad configurations requiring a 600 ohm termination. Refer to the mainframe operating instructions for additional information on calculating other pad values and the use of this resistor, or to Table I below.

Table I. Attenuator Pad Resistance Values

Amount of Attenuation	10 kΩ Pad Resistor Values (ohms)					
	R 6, 7, 9, 10		R 8		R 11	
	1%	5%	1%	5%	1%	5%
10 dB	2.61k	2.7k	6.98k	6.8k	not used	
14 dB	3.32k	3.3k	4.12k	4.3k	not used	
18 dB	3.92k	3.9k	2.55k	2.7k	not used	
20 dB	4.99k	5.1k	2.05k	2.0k	not used	
600 ohm Pad Resistor Values (ohms)						
10 dB	154	150	422	430	604	620
14 dB	200	200	249	240	604	620
18 dB	232	240	154	150	604	620
20 dB	243	240	121	120	604	620

$$R6 = R7 = R9 = R10 = \frac{R11 (\sqrt{N} - 1)}{2 (\sqrt{N} + 1)} \Omega$$

$$R8 = 2 * R11 \frac{(\sqrt{N})}{(N - 1)} \Omega$$

R11 = impedance of pad
where N = 10^{(Loss in dB)/10}

300 Hz HIGH-PASS FILTER

The high-pass filter is normally bypassed but may be enabled by clipping the wire jumper adjacent and parallel to capacitor C13 (between R14 and C9). Refer to Figure 2.

CONVERSION OF 1780A to 1780AT

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 2 for details.
2. Thread the four wires from the transformer (P/N 56-04-026667) through the larger center hole from the component side. Secure the transformer with the two screws and lockwashers provided.
3. Lay the module on the component side (circuit side up) and attach the four wires as shown in Figure 3.

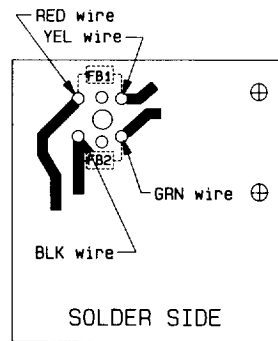
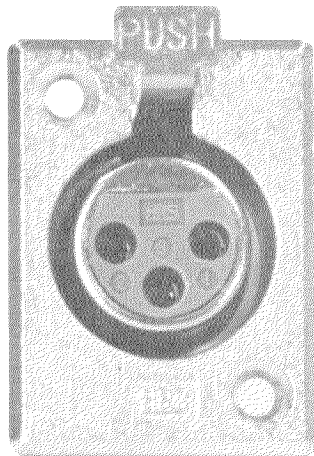
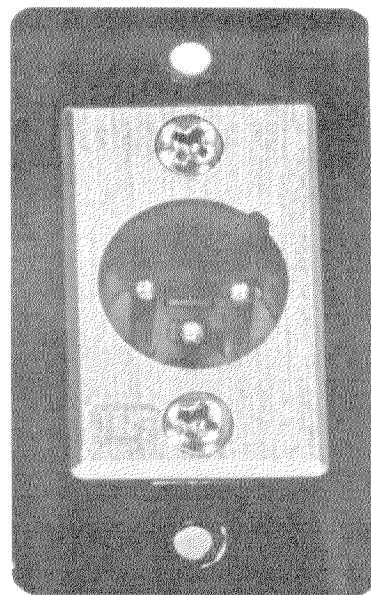


Figure 3. Bridging Input Transformer Connections

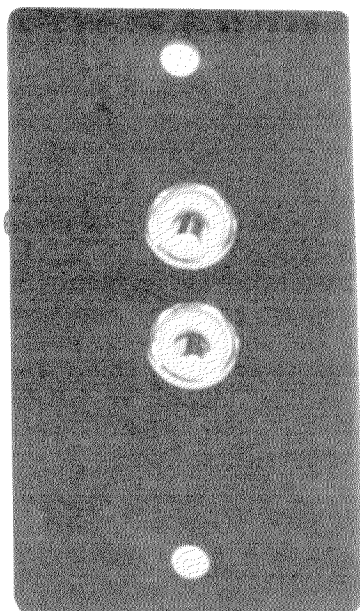
CONNECTORS FOR USE WITH 1780A AND 1780AT



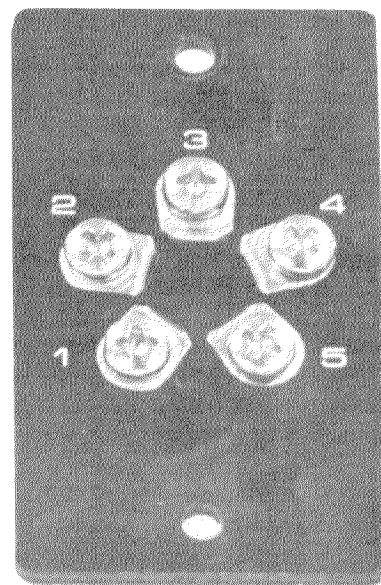
1791



1792



1793



1794

ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

The input preamplifier modules shall have a 20 dB resistive pad, phantom power capability, a 300 Hz high pass filter, continuously variable gain, L + R stereo summing, and one shall have a 10 k Ω input bridging transformer (**1780AT**). In addition, the modules shall be fully compatible with the 1700-series mixer/preamplifier and mixer/power 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, continuously variable. Frequency response: 50 Hz to 20

kHz, ± 1 dB. Source impedance: 150 Ω to 10 k Ω with a balanced microphone or line level input, and 40 k Ω with a tape preamplifier. Equivalent input noise: <120 dB below rated output voltage with a 200 Ω input termination. Total Harmonic Distortion (THD): <0.01% (**1780A**) at minimum gain, or <0.025% (**1780AT**). High pass filter corner frequency: 300 Hz. High pass filter slope: 12 dB/oct.

The input preamplifier module shall be the ALTEC LANSING Model **1780A** or the ALTEC LANSING Model **1780AT**.

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CONNECTOR OPTIONS FOR THE 1780A AND 1780AT

The **1780A** and **1780AT** have 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.

NOTE

When using the 1793 dual phono connector assembly, insure that the phantom power jumper is removed from J4.

The pinouts of the connectors are shown in Table II.

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)	not used
5	N/A	N/A	not used

NOTE

Only one input connector assembly may be used with the modules at a time.

OPTIONAL USE OF 1785A INPUT ISOLATION TRANSFORMER

The **1780AT** utilizes a 10k:10k ohm bridging transformer. (P/N 56-04-026667) which facilitates the use of a 10 k Ω pad. This maintains a high input impedance thereby serving as a bridging input.

The **1785A** input transformer is a 600:10k ohm transformer and may be used with the **1780A** without modifications if the resistive pad is not used. If the pad is required, the pad should be replaced with one having an impedance of 600 ohms. Resistor R11 may be omitted, however, since the primary of the **1785A** will load the network.

USE OF ALTERNATIVE TRANSISTORS

Normally, Q1 and Q2 are Toshiba 2SA970 low noise transistors, the same devices used on the 1781A. 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.

SERVICE INFORMATION

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 to persons or property resulting therefrom shall not be covered under warranty or otherwise.

PARTS ORDERING

To order replacement parts, look up the part number from the component parts list and call (405) 324-5311, Telex 160369, FAX (405) 324-8981, or write:

ALTEC LANSING Replacement Part Sales
P.O. Box 26105
Oklahoma City, OK 73126-0105 U.S.A.

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 written note describing the problem along with any other helpful information such as where used, how used, etc.

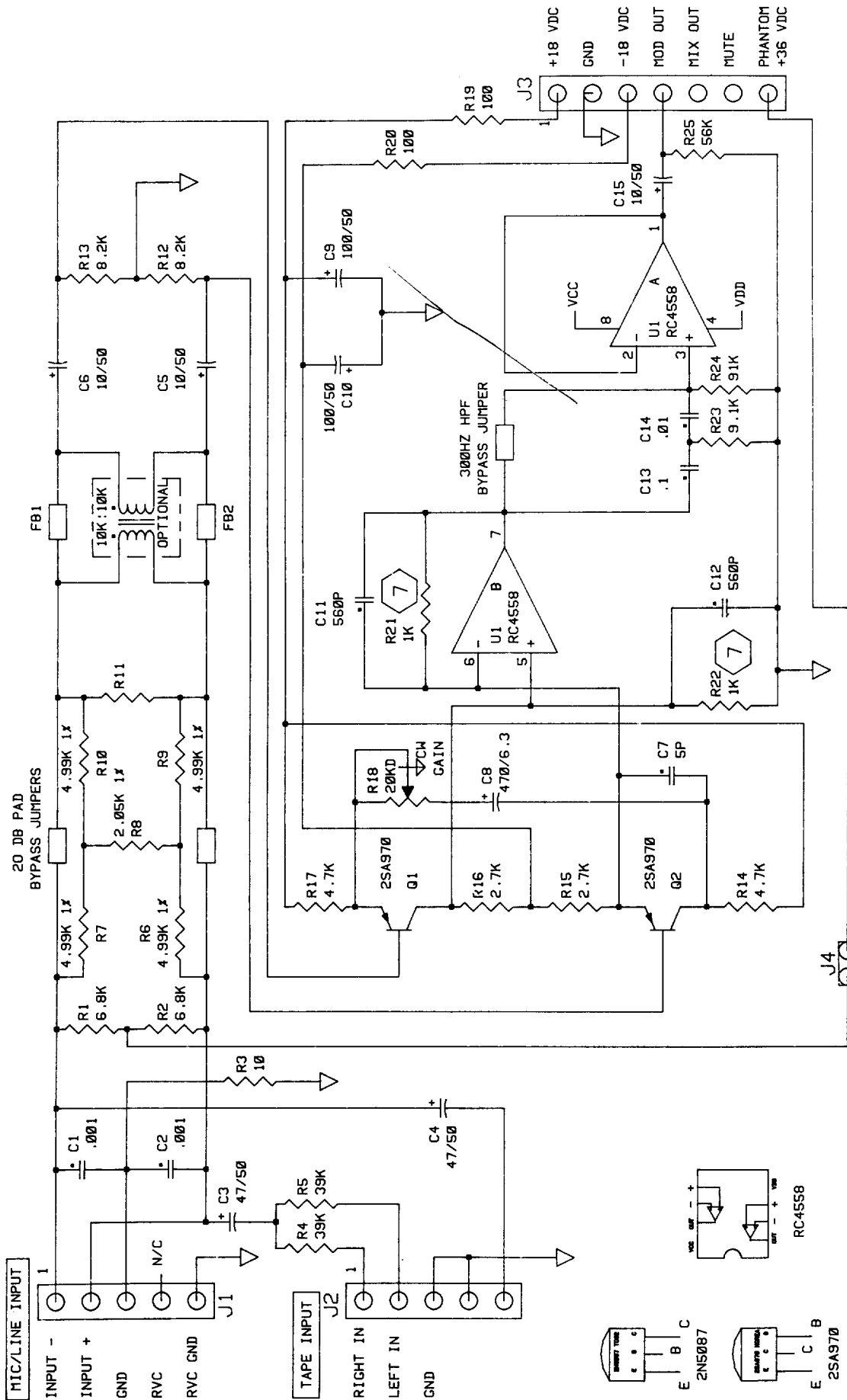
TECHNICAL ASSISTANCE

For applications assistance or other technical information, call the Technical Service Manager at (405) 324-5311. You may also Telex 160369, FAX (405) 324-8981, or write:

ALTEC LANSING Technical Service Manager
P.O. Box 26105
Oklahoma City, OK 73126-0105 U.S.A.

COMPONENT PARTS LISTING

Designator	Description	Altec P/N
	Phantom Power Jumper	21-01-124456
C1,2	.001 μ fd/50 VDC Cap	15-02-026629
C3,4	47 μ fd/50 VDC Cap	15-01-026641
C5, 6, 15	10 μ fd/50 VDC Cap	15-01-124502
C7	5 pfd/50 VDC Cap	15-01-026625
C8	470 μ fd/16 VDC Cap	15-01-026640
C9,10	100 μ fd/25 VDC Cap	15-01-026639
C11,12	560 pfd/50 VDC Cap	15-02-026631
C13	.1 μ fd/50 VDC Cap	15-02-026628
C14	.01 μ fd/50 VDC Cap	15-02-026630
R1,2	6.8 k Ω , 5%, 1/4 watt Res.	47-01-102098
R3	10 Ω , 5%, 1/4 watt Res.	47-01-102030
R4,5	39 k Ω , 5%, 1/4 watt Res.	47-01-102116
R6,7,9,10	4.99 k Ω , 1%, 1/4 watt Res.	47-03-124696
R8	2.05 k Ω , 1%, 1/4 watt Res.	47-03-122813
R12,13	8.2 k Ω , 5%, 1/4 watt Res.	47-01-102100
R14,17	4.7 k Ω , 5%, 1/4 watt Res.	47-01-102094
R15,16	2.7 k Ω , 5%, 1/4 watt Res.	47-01-102088
R18	20 k Ω reverse log pot, D taper	47-06-026626
R19,20	100 Ω , 5%, 1/4 watt Res.	47-01-102054
R21,22	1 k Ω , 5%, 1/4 watt Res.	47-01-102078
R23	9.1 k Ω , 5%, 1/4 watt Res.	47-01-026633
R24	91 k Ω , 5%, 1/4 watt Res.	47-01-102126
R25	56 k Ω , 5%, 1/4 watt Res.	47-01-102121
Q 1,2	2N5087	48-03-026635
U1	RC4558	17-01-122955
T1	10k Ω :10k Ω Bridging Transformer	56-04-026667



7. RESISTOR VALUES CHANGED FROM 1K TO 3.16K OHM 1%, P/N:47-03-121329. THIS MODIFICATION INCREASES THE GAIN OF THE MODULE BY 10DB, FOR IMPROVED SENSITIVITY WHEN USED WITH LOWER OUTPUT MICROPHONES. THE INCREASE IN SENSITIVITY ALSO REDUCES THE MAXIMUM ALLOWABLE LINE INPUT LEVEL BY 10DB.
8. THE TRANSISTOR USED FOR Q1 AND Q2 MAY BE A 2SA970 OR A 2N5087, PLEASE OBSERVE PIN ORIENTATION IF REPLACING.
9. R8 SHOULD BE LIFTED FROM CIRCUIT WHEN PAD BYPASS JUMPERS ARE USED.
10. R11 IS A USER SELECTED RESISTOR, REFER TO MANUAL FOR PROPER USE.
11. ALL CAPACITORS ARE IN MICROFARADS/VOLT.
12. ALL RESISTORS ARE IN OHMS, 5%, 1/4 WATT.
13. PIN 1 OF J3 TOWARDS REAR OF MAINFRAME.

NOTES: UNLESS OTHERWISE SPECIFIED

Figure 5. Schematic 1780A and 1780AT (11C595-01)