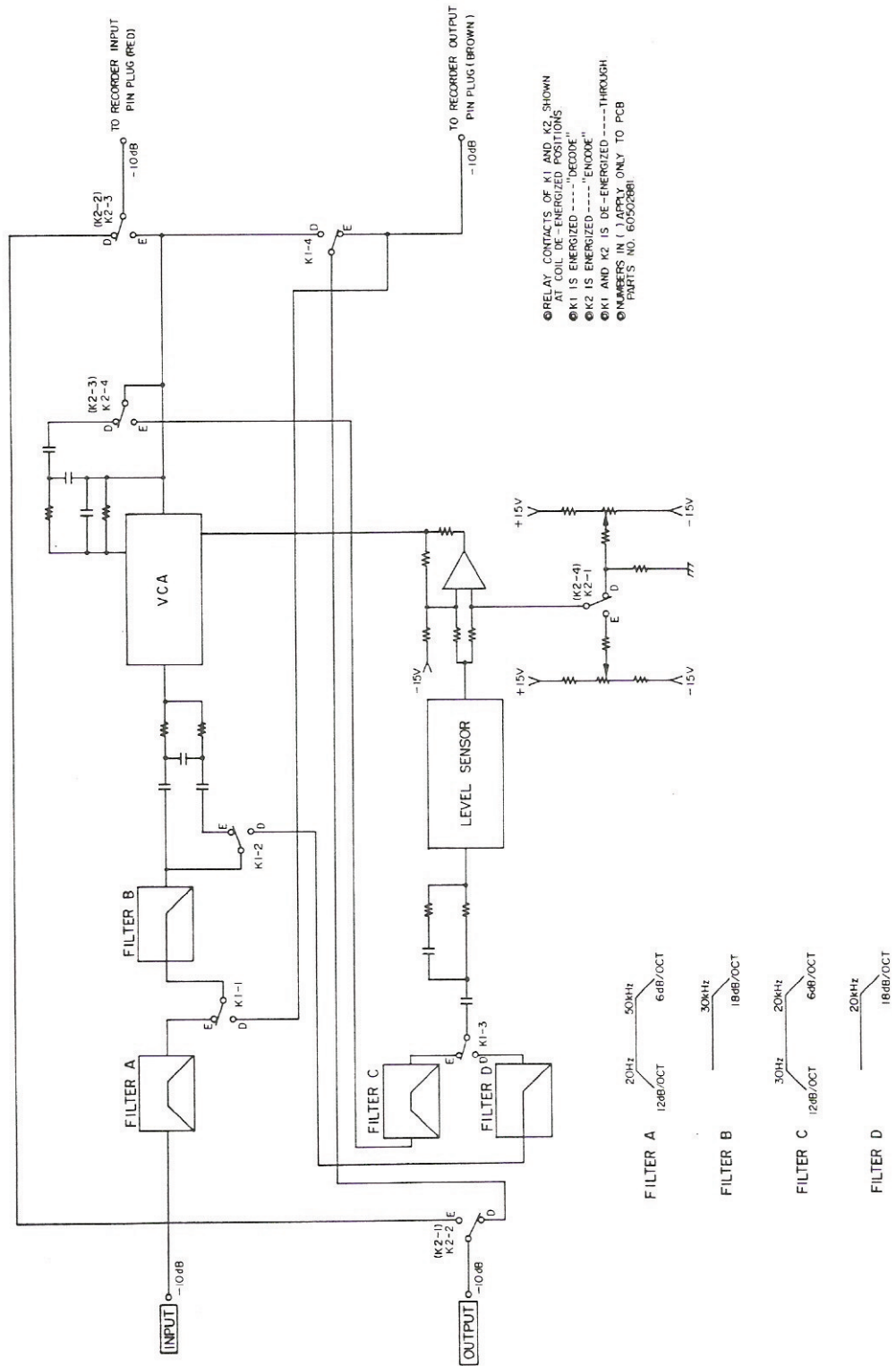


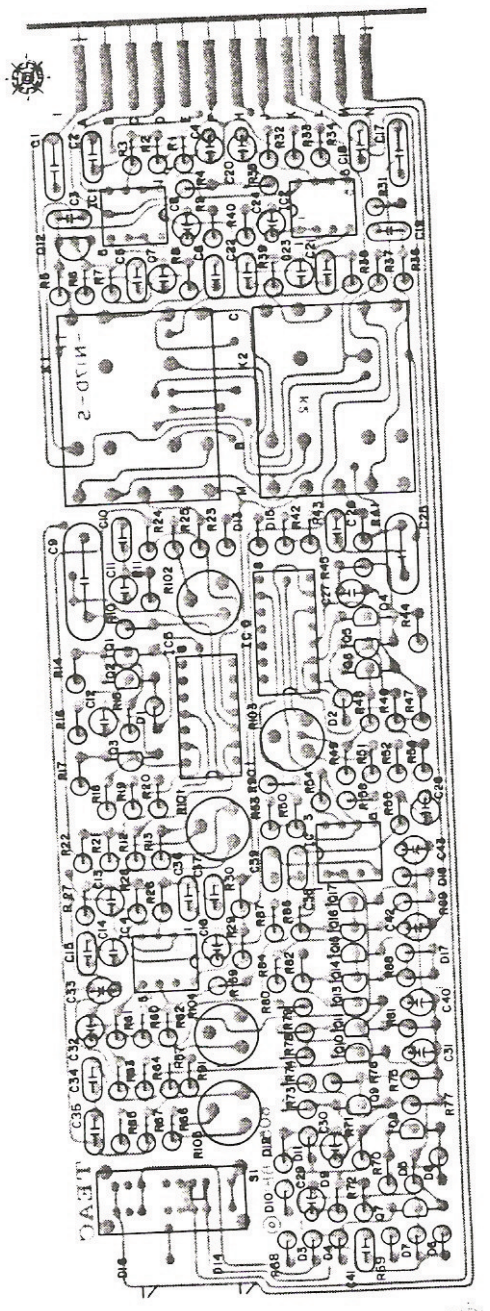
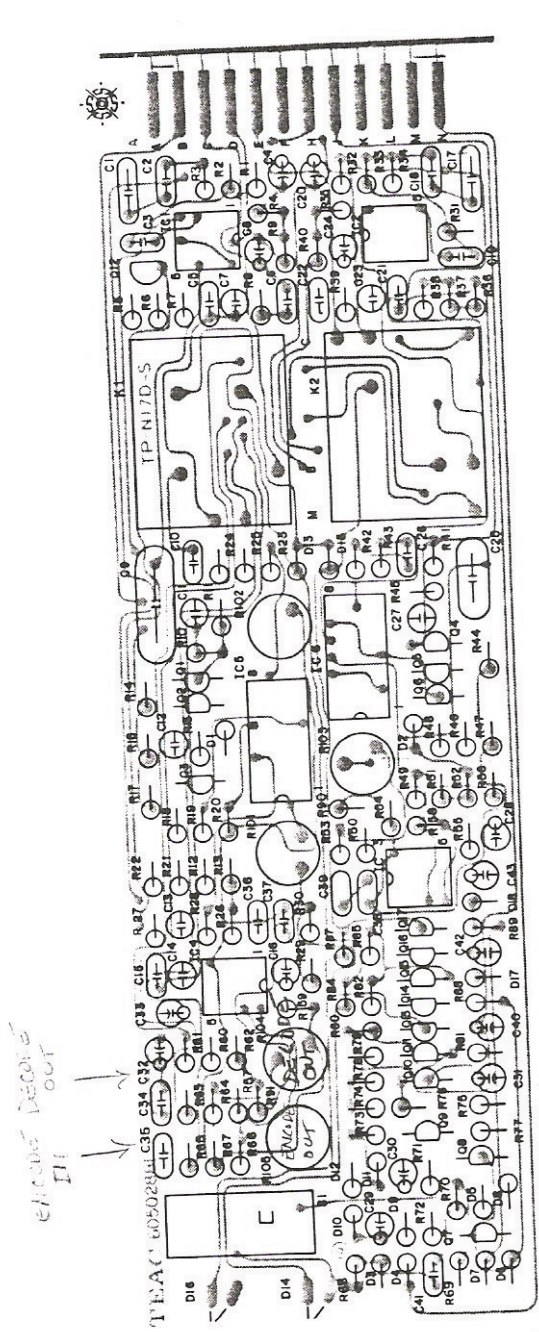
3. BLOCK DIAGRAM

Model DX-8 Noise Reduction Module



7. PCB ASSEMBLIES AND PARTS LIST

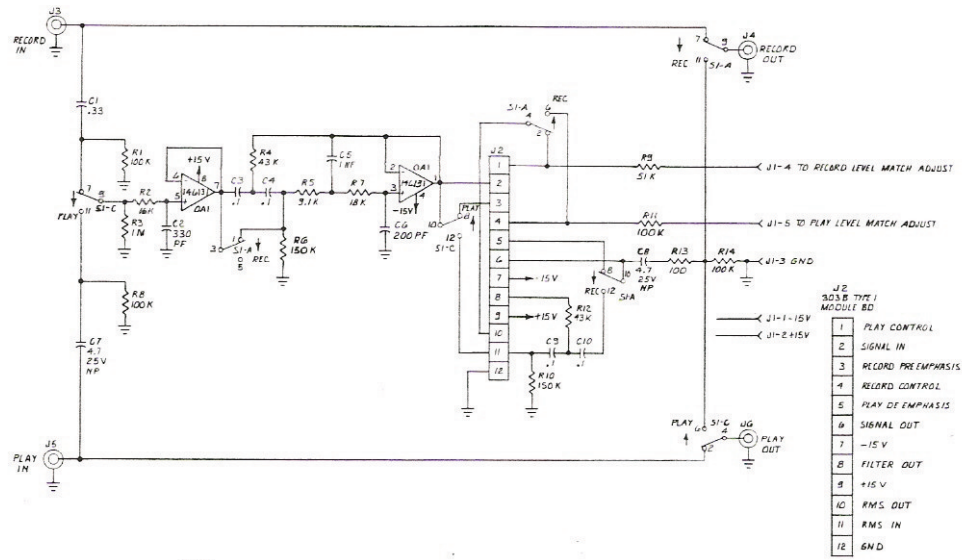
7-1 DBX amplifier PCB assembly (Up to serial #232)



LOCATION OF COMPONENTS
DBX amplifier PCB ass'y
(up to serial #232)
REV. _____

DBX

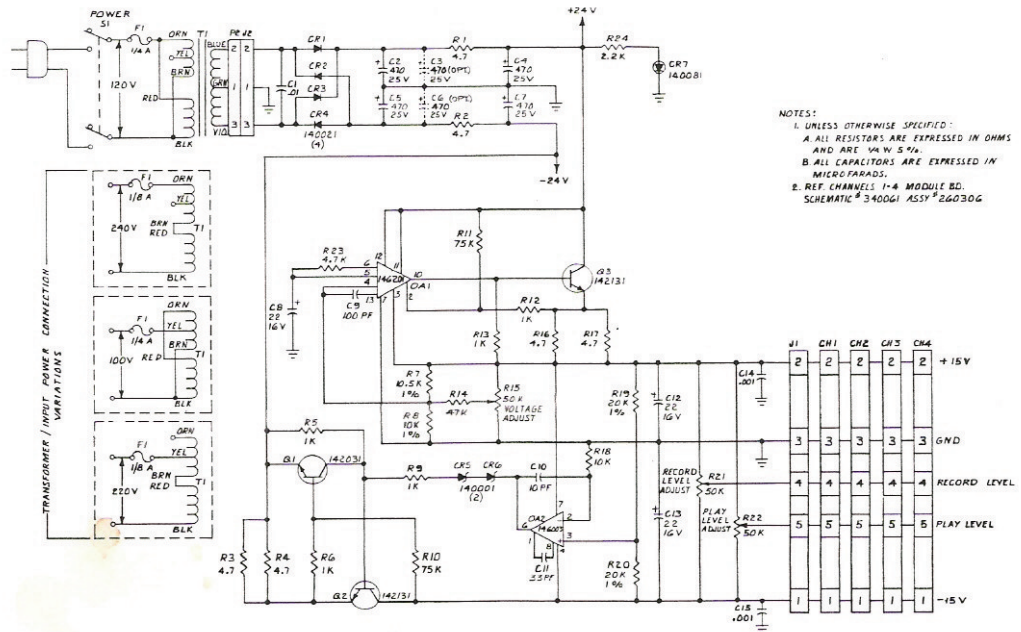
Module Board



SCHEMATIC DIAGRAM

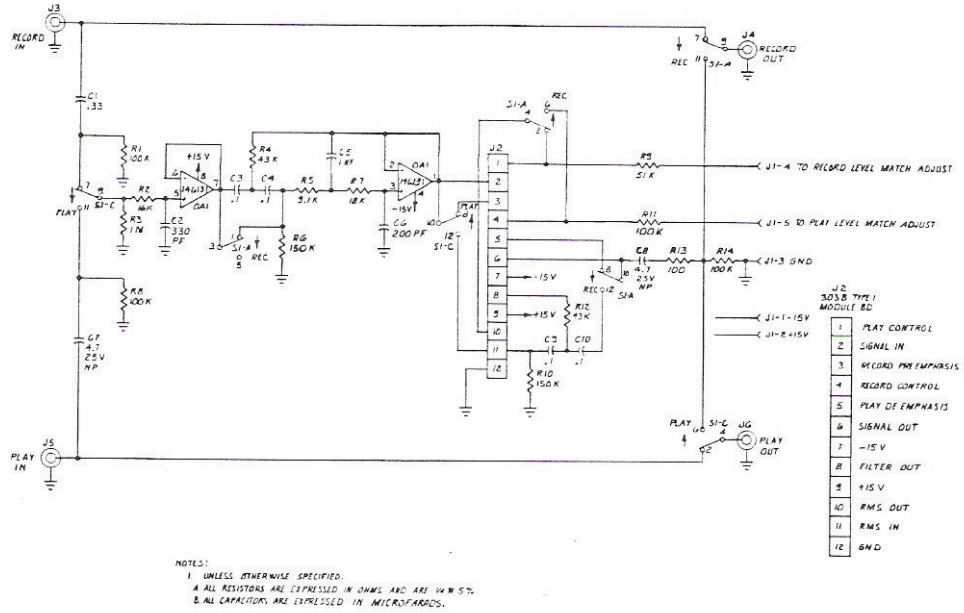
Power Supply

38



DBX

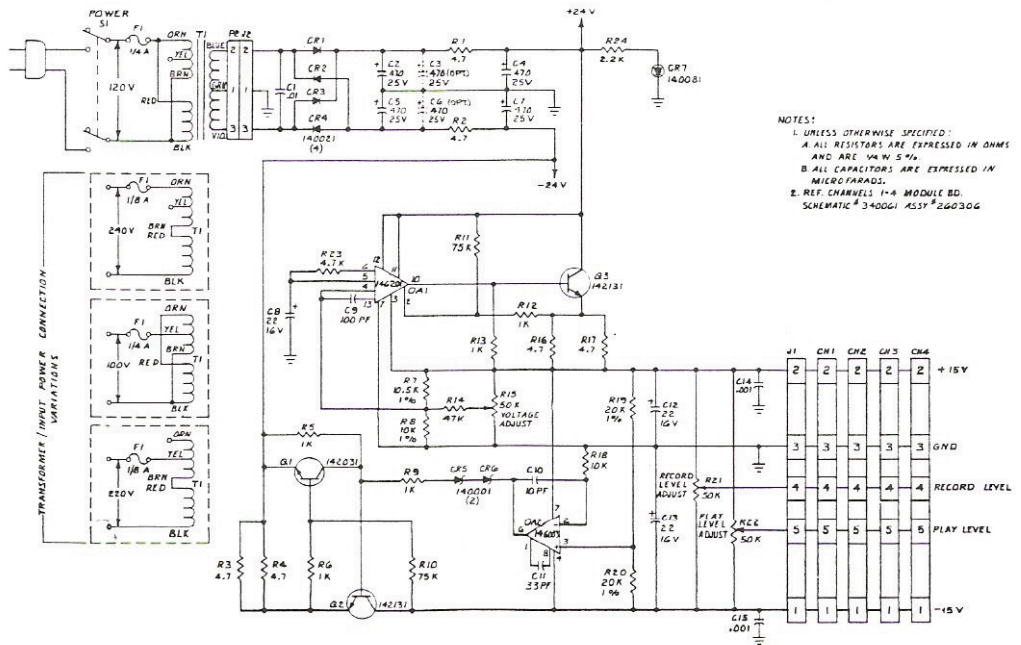
Module Board



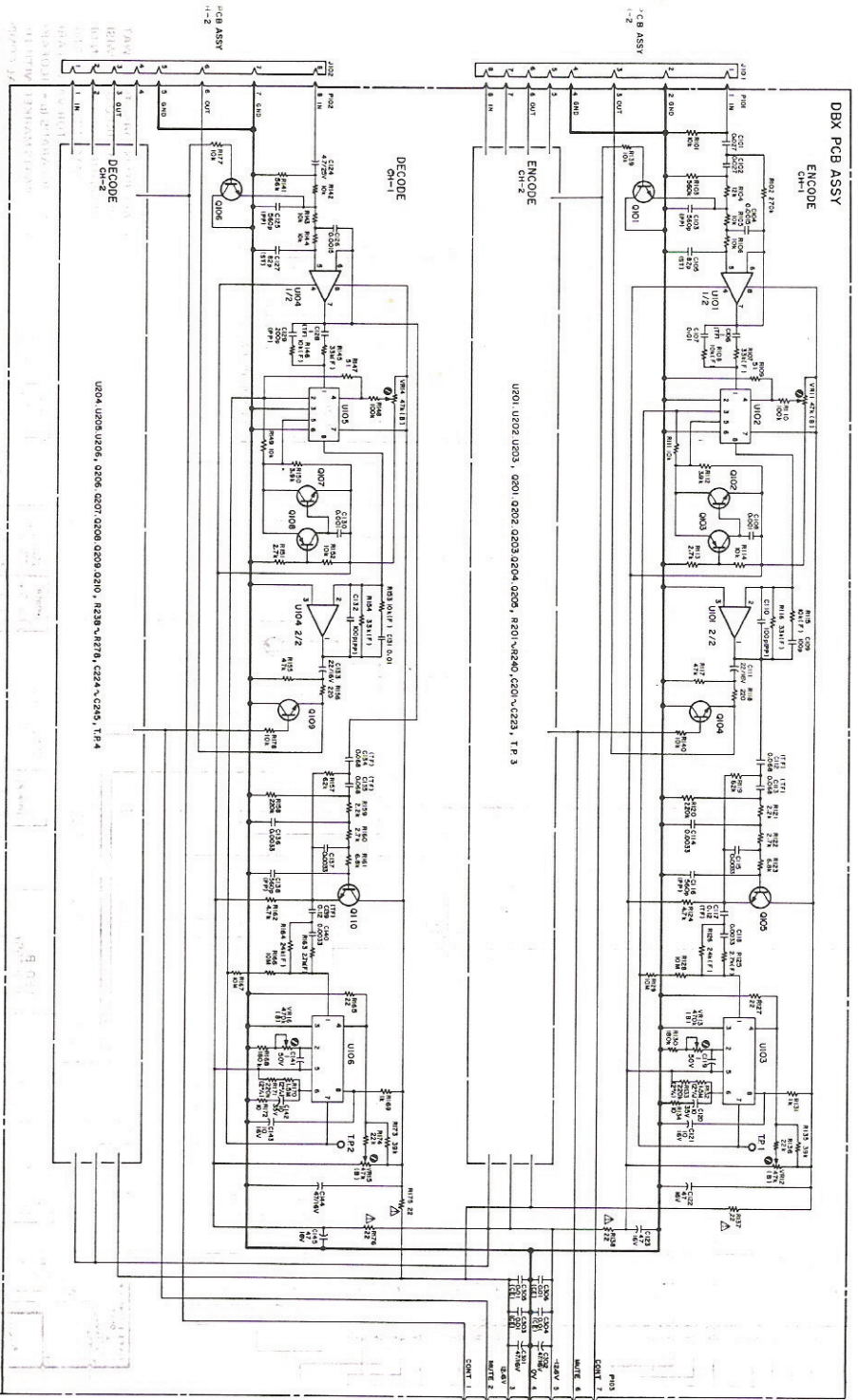
SCHEMATIC DIAGRAM

Power Supply

38



ASCAM DX-2D/DX-4D DBX AMPLIFIER SCHEMATIC DIAGRAM
IC Production Products

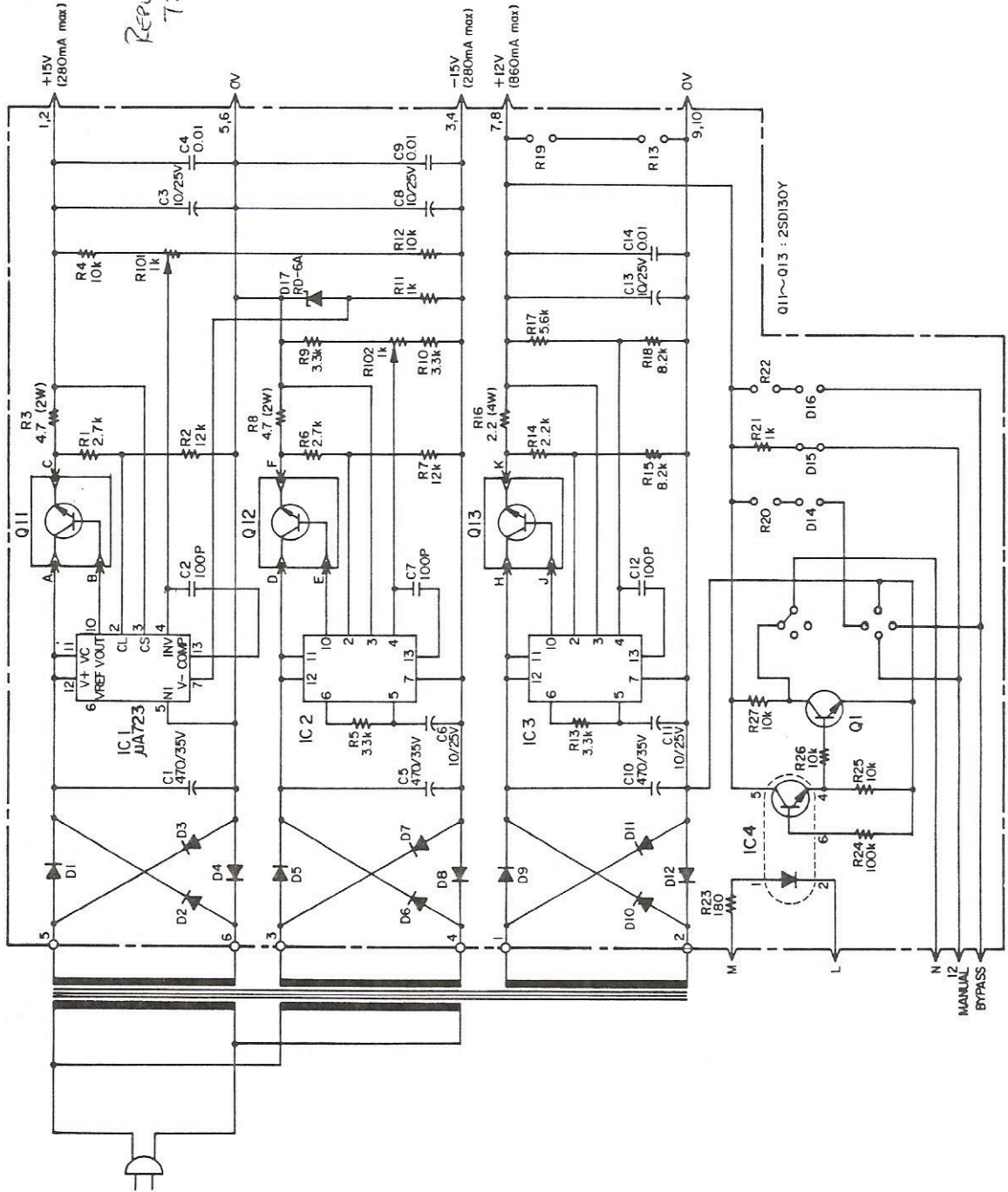


U101 U102/U104 U104	74181	4-BIT ALU
U102 U103 U105 U106	74180	4-BIT BCD DECODER
U103 U104 U106 U107	74104	2/2 INVERTER
U107 U108 U109 U110	74100	2-INPUT NAND GATE
R101 R102 R103 R104	10K	RESISTOR
R105 R106 R107 R108	100K	RESISTOR
R109 R110	1K	RESISTOR
C101 C102 C103 C104	100P	CAPACITOR
C105 C106 C107 C108	10N	CAPACITOR
C109 C110	100N	CAPACITOR

DBX Nois

8-3 Power supply PCB (DX-8 & 16)

Replace Both
723s first



SCHEMATIC
Model DX-8 Power Supply PCB
REV. _____

4.6.2 General description

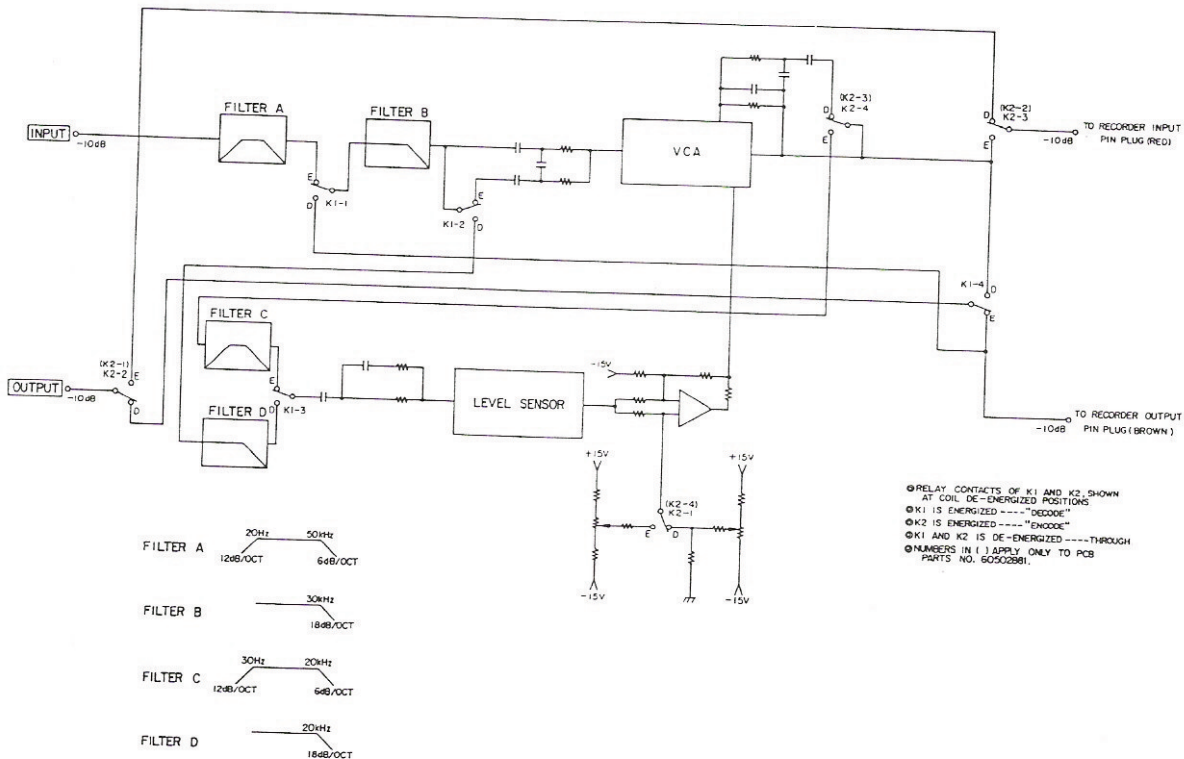
The DX-16A is exclusively designed for integration into the TEAC Tascam Series 85-16 Recorder/Reproducer. Since this system alone will provide approximately 30 dB noise reduction and improve the tape saturation point by about 10 dB, its combined use with the Model 85-16 will give a dynamic range of 100 dB.

The DX-16A is the switchable type whereby the compression circuit (ENCODE mode) and the expansion circuit (DECODE mode) are selected by a set of relays. Each channel can be independently switched from the DECODE mode to the ENCODE mode by a record mode control signal from the Model 85-16. When the front panel DBX IN/OUT switch is set to OUT, the noise reduction circuits can be bypassed without changing connections.

4.6.3 Connections

Please refer to the diagram in Item 3.3 for connecting the DX-16A. Connect the accessory parts by instructions numbered (7) through (10) in the diagram.

4.6.4 Block diagram



Note: The positions of the relay contacts shown in this diagram are for the de-energized state (relays K1 and K2) and the signal is passed through without any encoding or decoding.

Energizing K1 sets the circuit to Decode and energizing K2 for Encode.

4.6.5 Specification

1. Number of channels 16, switchable to encode or decode
2. Input
 - Impedance Greater than 50 kohms
 - Nominal input level -10 dB (0.3 V)
 - Maximum input level +16 dB (6.3 V)
3. Output
 - Load impedance Greater than 10 kohms
 - Nominal output level -10 dB (0.3 V)
 - Maximum output level +16 dB (6.3 V)
4. Frequency response (back to back) 40 Hz ~ 20 kHz , 1 dB
30 Hz ~ 20 kHz , $\begin{matrix} +1 \\ -3 \end{matrix}$ dB
5. Distortion (back to back) 0.3% max. at 1 kHz
0.8% max. at 100 Hz
6. Effect of the dbx system on recording
A 100 dB dynamic range is possible by the 30 dB noise reduction and 10 dB improvement in the saturation point.

4.6.6 Testing and adjustment

- 1) Power supply voltage (Power supply PCB ass'y: 6085519000)
 - a. Adjust pot R101 so that the DC voltage is the same +15 V and -15 V (tracking adjustment to be within 0.1 V).
 - b. Voltage error for +15 V and -15 V must be within ± 0.75 V. If tolerance cannot be adjusted within this spec., replace the I.C., MC-1468L.

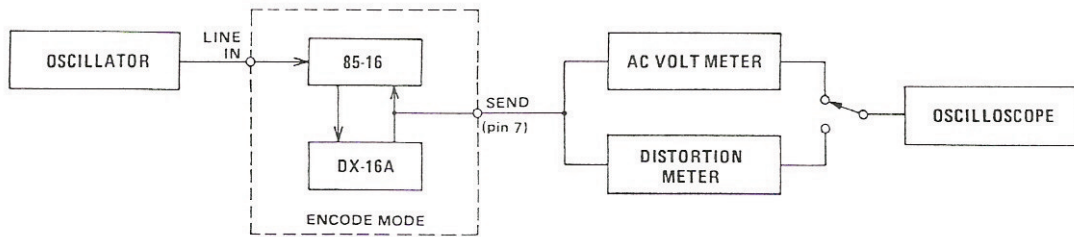
2) Encode circuits

Each channel of the DX-16A is individually put into the ENCODE or DECODE mode by the control signal from the 85-16.

However, when power is supplied to the DX-16A and its front panel DBX ON/OFF switch is set to IN, it will go to the DECODE mode but will not go to the ENCODE mode unless there is a control signal from the 85-16. Therefore, at testing the DBX module separately from the tape deck, follow the next procedures.

Put CH-1 in the ENCODE mode by setting CH-1 in the INPUT mode. In the same way, CH-2 and other channels, are put in the ENCODE mode by setting each in the INPUT mode.

- a. Hookup the test equipments to the DX-16A as shown in the block diagram.



Test equipment required

Oscillator	Audio use, distortion less than 0.1% (at 1 kHz)
AC voltmeter	-80 dB ~ +40 dB, imp. = > 1 Mohm, < 25 pF
Oscilloscope	General purpose
Distortion meter	100% ~ 0.3% , imp. = > 10 kohms

- b. Apply a 1 kHz, -10 dB (0.3V) signal to the CH-1 input of the 85-16.
- c. Use Extension Card (Part No. 6085377100) to adjust pots on the PC cards.
NOTE: Although installing or removing PC cards with the power supply ON will not damage the DX-16A, it is good practice to always switch OFF the DX-16A power when doing so, as noise or transients thus induced might damage circuits connected to the OUTPUT.
- d. Connect the AC voltmeter to pin #7 (pin #6: COM) for CH-1 on the extension card.
- e. Set all pots on the PC card to their center position.
- f. Adjust R105 for -10 dB, ± 0.5 dB reading on the AC voltmeter connected to pin #7 of the extension card.
- g. Connect an oscilloscope between pin #10 (TP2) and pin #6 (0V) of the extension card and feed a 100 Hz, -10 dB (0.3V) signal to the CH-1 LINE IN of the 85-16. *~ 125mV 100 / -100mV @ 1K*
Although DC output from the lever sensor is obtained at this check point, monitor with the oscilloscope the DC output ripple content (200 Hz) and adjust R103 so that the ripple becomes less than 1 mVp-p (See Figs. 1 and 2).
- h. Reset the INPUT signal to 1 kHz, adjust R105 for a -10 dB ± 0.5 dB reading on the AC voltmeter, and measure distortion. It should be less than 0.3% (See Figs. 3 and 4).
After distortion adjustment, repeat level setting to ± 0.1 dB.
If distortion is inferior to this, adjust R102 for an input level of -10 dB, and R101 for an input level of -30 dB, until minimum distortion is obtained. Alternately repeat this process at both levels until best point is reached.
- i. Check the frequency response. The normal, good condition reading should be -2.5 dB ± 0.5 dB at 100 Hz; and -4.5 dB ± 0.5 dB at 10 kHz; both referenced to 1 kHz.
- j. Check the S/N ratio. Turn OFF the input signal and measure the S/N ratio. Under normal condition, it should be 45 dB unweighted, and 48 dB weighted.
- k. Adjust the remaining channels 2 ~ 16 in the same way.
- l. Faulty operation can also be corrected by comparing with the normal condition waveforms, Figs. 5, 6, 7, and 8.

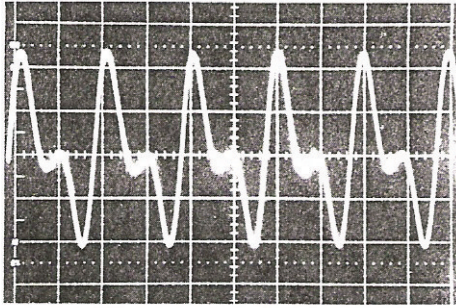


Fig. 1 Improper setting of R103

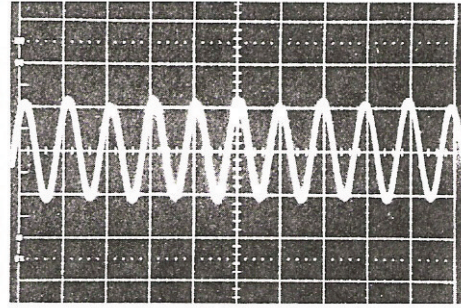


Fig. 2 Proper setting of R103

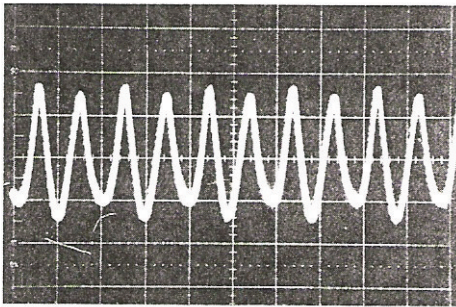


Fig. 3 Improper setting of R101 or R102
0.5% distortion (at 1 kHz)

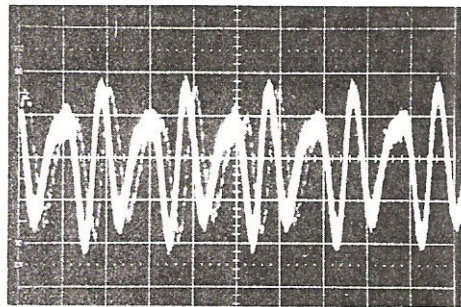


Fig. 4 Proper setting of R101 or R102
0.16% distortion (at 1 kHz)

Normal condition waveforms

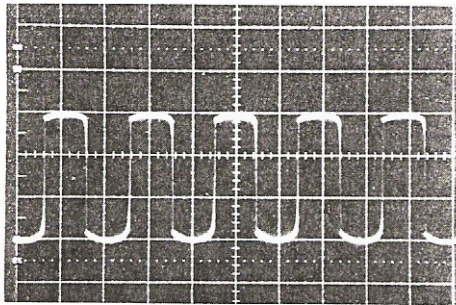


Fig. 5 At pin #9 of BA652

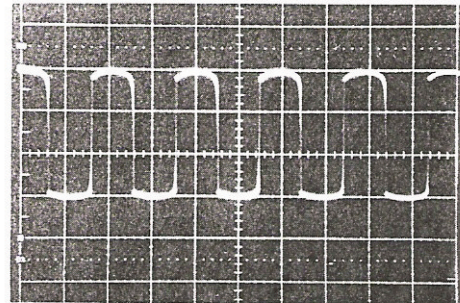


Fig. 6 At pin #5 of BA652

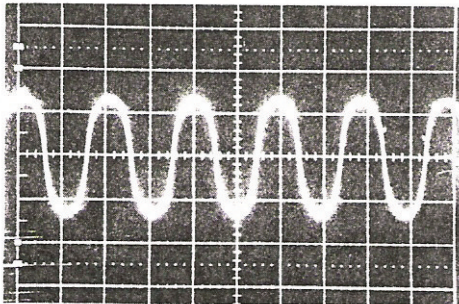


Fig. 7 At collector of Q3

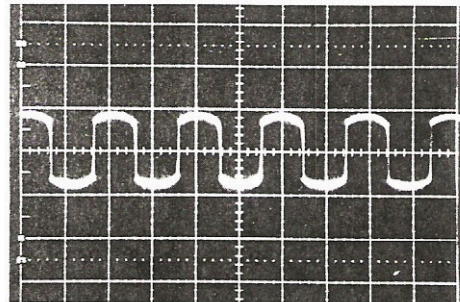
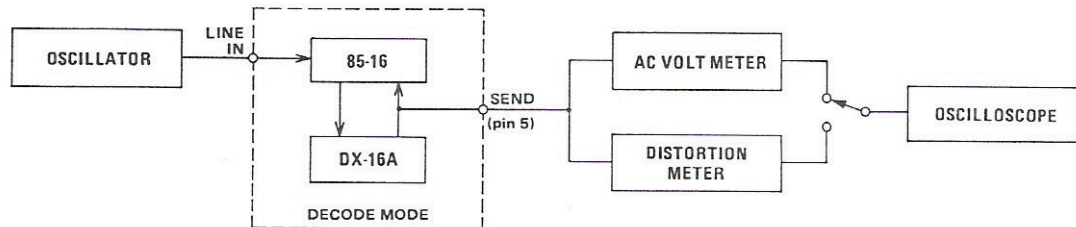


Fig. 8 At drain of Q4

3) Decode circuits

- a. Hook up the test equipments to the DX-16A as shown in the block diagram.
Test equipment specifications are the same as listed for the Encode Circuit test.



- b. Disconnect the Remote Cord between the 85-16 and DX-16A to put the DX-16A in the DECODE mode. The signal is then routed from LINE IN through LINE OUT of the 85-16 and then fed to DEC RCV of the DX-16A.
- c. In the same way as for checking the ENCODE mode, apply a 1 kHz, -10 dB (0.3 V) signal to CH-1 LINE INPUT of the 85-16.
- d. Connect the AC voltmeter to CH-1 LINE OUT of the 85-16.
- e. Use Extension Card (Part No. 6085377100) to adjust pots on the PC cards.
- f. On applying a -10 dB signal to the input of the 85-16, check pin #3 of the extension card for a -10 dB level. If the level here is different, reset the Input Monitor Level control (R207) on the 85-16 to obtain -10 dB.
- g. Adjust R104 to obtain a -10 dB reading on the AC voltmeter connected to the OUTPUT.
- h. Measure distortion. It should be less than 0.3% when properly aligned. If it is higher than 0.3%, adjust R101 and R102, by the same procedure outlined for the Encode Circuits.
Always check whether distortion is within specification again by rewiring the circuit to the Encode Mode whenever R101 and R102 are adjusted.
- i. Check the frequency response. The normal, good condition reading should be +5 dB \pm 1 dB at 100 Hz; and +9.5 dB \pm 1 dB at 10 kHz; both referenced to 1 kHz.
- j. Check the S/N ratio. Switch OFF the DECODE IN signal to measure S/N. Normal condition reading should be better than 85 dB unweighted, 90 dB weighted.
- k. Adjust the remaining channels 2 ~ 16 in the same way.

NOTE: * In making actual adjustments, it is not good practice to adjust all channels separately in the ENCODE and DECODE modes. It is advisable to adjust the ENCODE mode of one channel, then check the DECODE mode of the same channel. If distortion is within spec, the only adjustment will be level setting of the DECODER.

* The remaining procedures will be checking frequency response, S/N ratio, etc.

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