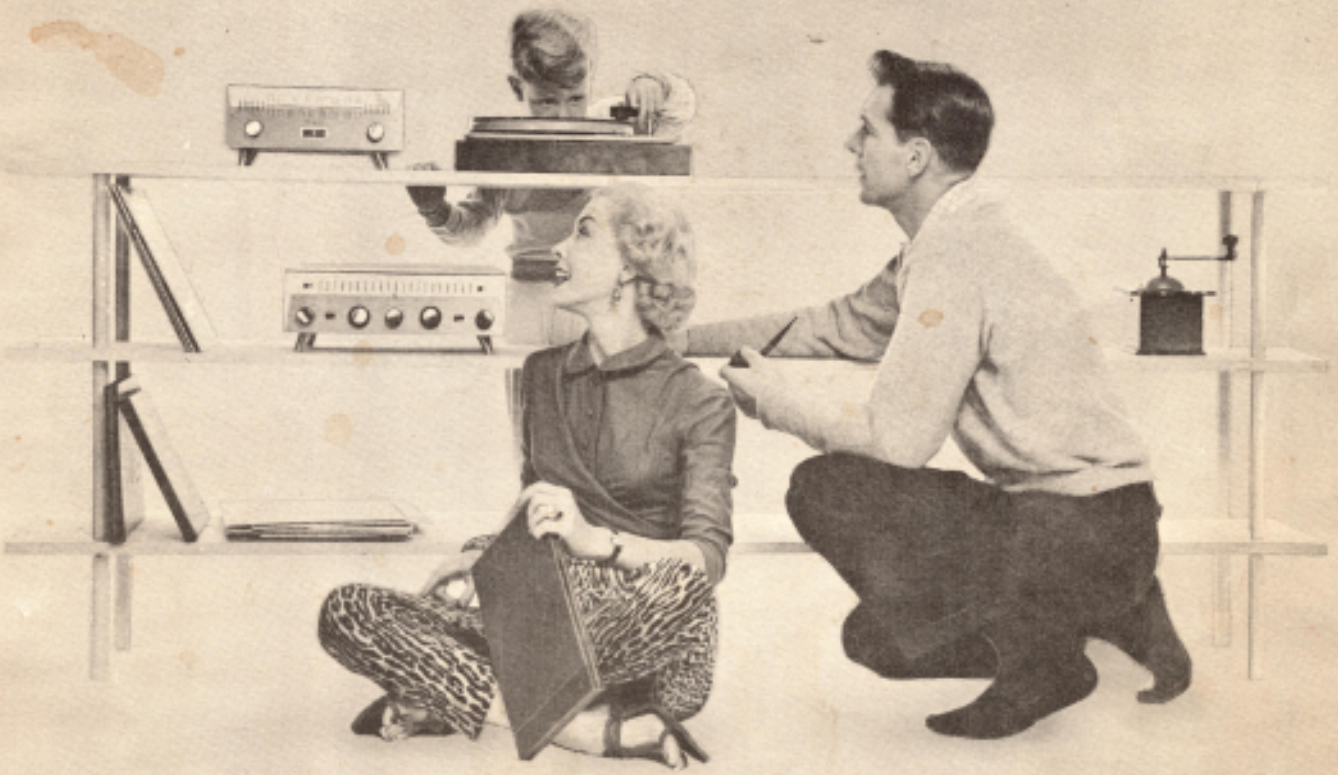
Instruction Manual



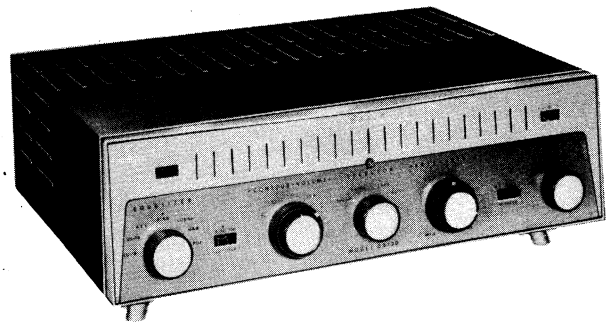
MODEL DB130

HIGH FIDELITY AMPLIFIER

***David Bogen* Company**

P. O. BOX 500
PARAMUS, N. J.

A Division of The Siegler Corporation



DESCRIPTION

Bogen Model DB130 has been designed to satisfy the most exacting demands of critical audiophiles for a truly high quality 35-watt amplifier.

The DB130 features:

--a built-in preamplifier with provisions for inputs from high and low level magnetic cartridges as well as crystal, ceramic and other constant-amplitude cartridges;

--a four-position input Selector with phonograph, radio (tuner), tape, and auxiliary (TV, high level crystal microphone, etc.) positions;

--a seven-position Equalizer with precise curve settings from 16 to 30,000 cps for virtually all 78, 45 and 33-1/3 rpm records;

--the unique Variable Damping Factor Control (Pat. Pend.) which greatly reduces loudspeaker system resonances and low frequency distortion;

--an Ultimate Damping Indicator to facilitate adjustment for ultimate damping;

--a Loudness Contour selector which maintains constant tonal balance between high and low frequencies at all sound levels;

--separate three-position sharp-cutoff feedback-type High and Low Frequency Filter controls which may be used to minimize noise, distortion and rumble at an attenuation rate of 12db per octave below 100 or 50 cycles and above 4 or 8 kilocycles;

--a three-position Speaker Selector switch;

--separate Bass and Treble controls for full tonal variation to correct for listening room or recording acoustics;

--radically new constant-voltage output-stage screen-grid regulation resulting in greatly reduced intermodulation and harmonic distortion;

--the exclusive (Pat. Pend.) Bogen *Controlled Positive Feedback* circuit which provides an improvement in distortion reduction and in true low frequency response (Infinity Damping Factor when D.F. switch is OFF);

--a grain-oriented high-grade steel alloy output transformer which gives higher efficiency and vastly superior base response.

POWER REQUIREMENTS: Range 105-125 volts, 60 cycles AC, 80/150 watts at 117 volts nominal.

UNPACKING AND SHIPPING NOTES

Inspect the shipping container and the unit for any indications of improper handling. The unit was carefully checked for condition before leaving the factory. If the unit has been damaged, make an immediate claim to the dealer or distributor from whom it was purchased. If the unit was shipped to you, notify the transportation company without delay and place your claim. Check the carton for an envelope containing four #8 x 1-1/4" self-tapping screws and four #8 x 7/16" flat washers for mounting the chassis in a cabinet.

INSTALLATION

FACTORS TO BE CONSIDERED

1. **Ventilation:** The amplifier should be adequately ventilated. If the unit is mounted in an open backed console this will not be a problem. If mounted in a completely enclosed cabinet, sufficient holes should be provided for free circulation of air. A minimum space of two inches should be left clear between the top of amplifier and the shelf above.

2. **Ease of Control:** The amplifier should be mounted in a position and at a height which will permit easy reading of the dial. It may be mounted vertically (dial facing upwards) as well as in the conventional position. The cabinet should be so constructed that no projections will make adjustment of the controls difficult.

3. **Accessibility of Parts:** The amplifier should be installed in the cabinet with sufficient space allowed so that tubes may be removed and connections at the rear of the amplifier may be readily made and changed.

SPECIFICATIONS

Power Rating: 35 watts **Peak Power:** 70 watts
Tone Burst Peak Power: Up to 100 watts on short duration transients
Frequency Response: ±0.5db, 15-30,000 cps
Harmonic Distortion: 0.3% @ 35 watts
Intermodulation Distortion: Less than 1.5% @ 35 watts
Gain: PHONO (LO MAG): 110db: PHONO (HI MAG); 104db; TAPE: 116db; AUX 1 and 2, TUNER: 85db
Hum and Noise: Fundamental -85db; Low Level Inputs -60db; High Level Inputs -80db
Inputs: LO MAG, HI MAG, HI FI XTAL, TUNER, TAPE, AUX
Outputs: SPEAKER(S), TAPE
CONTROLS:
POWER (ON-OFF)
VOLUME
BASS: +15...0...-15db
TREBLE: +15...0...-15db
CONTOUR (Loudness-Contour): 0,-5,-10,-20,-30db
SELECTOR (Inputs): PHONO, RADIO, TAPE, AUX
EQUALIZER: EU78, US78, AES, RIAA, COL LP, NAB, POP
DAMPING FACTOR: +0.1...Infinity...-1.5
LO FILTER: Flat, 50c, 100c
HI FILTER: Flat, 8kc, 4kc
SPEAKER SELECTOR: A, AB, B
SPEAKER IMPEDANCE SELECTOR: 8, 16 ohms
AUX ADJ: Auxiliary channel level-set control
HUM ADJ: Adjustment for minimum hum
Output Impedances: 16, 8, and 4 ohms
Input Impedances: LO MAG - 100K; HI MAG - 100K; HI FI XTAL - 120K; TUNER, TAPE, AUX - 500K
Power Consumption: 117 volts, 60 cps, 80/150 watts
Tubes: One 12AX7/ECC83, one 12AU7/ECC82, one 12AX7, two 6CG7, two 6AV5GT, two 5Y3GT
Overall Dimensions: 15" x 10-3/8" x 4-3/8" (with legs 5-3/8")
Net Weight: 22 pounds

4. **Acoustical Isolation:** If the amplifier and the loudspeaker(s) are installed in the same cabinet, the separation should be sufficient to prevent mechanical speaker vibration from being picked up by the amplifier. Although the equipment is designed to minimize the effect, some acoustical vibration may be transmitted from a speaker to the electron tubes, adversely affecting fidelity, if the amplifier and speaker(s) are located too near each other.

CHASSIS MOUNTING IN CABINET

Using the four #8 x 1-1/4 self-tapping screws and #8 flat washers supplied, observe the following procedure in the order set down.

Preparation of Cabinet Front Panel:

1. Using scotch tape or rubber cement, secure the template on page 2 and 11 to the face of the cabinet so that the center line of the template is on the same line as the center of the cabinet and top of the "Mounting Shelf" line on the template is flush with the top edge of the mounting shelf.

2. Using a sharp awl or similar tool, prick through the points marked "X" on the template into the surface of the cabinet.

3. Carefully remove the template from the cabinet front panel.

4. Using a pencil, straight edge and compass, connect the "X" points on the front panel so that the cutout area as defined by the dotted lines on the template is reproduced on the cabinet panel. Cut out this area in the front panel.

Preparation of Cabinet Mounting Shelf:

1. Insert the amplifier through the front panel cutout so that the amplifier's front panel escutcheon fits tightly against the cabinet front panel surface.

2. With the amplifier held in the above position, reach through the back of the cabinet and draw a line on the cabinet mounting shelf which is coincidental with the chassis rear panel and sides. This line is representer on the template as "BACK OF CHASSIS".

3. Remove the amplifier from the cabinet.

4. Place the template on the cabinet mounting shelf so that the "BACK OF CHASSIS" line is even with the pencil line described in Step 2.

5. Using a sharp awl or similar tool, prick through the center points of the holes marked "Y" on the template.

6. Carefully remove the template from the mounting shelf and return it to the instruction booklet.

7. Using a 7/32" diameter bit, drill the four "Y" holes through the cabinet mounting shelf.

Installation of Amplifier In Cabinet:

1. Insert the amplifier through the front panel cutout so that the tuner's front panel fits tightly against the cabinet outer surface.

2. Holding the amplifier in this position, slip one of the supplied washers over each screw and insert the screws through the holes into the chassis from the under side of the cabinet mounting shelf. Tighten securely.

HUM ADJUSTMENT

1. Test the amplifier for hum by setting the volume control at minimum gain position. With ear held as close as possible to the speaker, note the hum level. Vary the hum adjustment shaft (located on the top rear of the chassis) with a screwdriver until the minimum hum position is located.

2. For the second hum adjustment, set the Selector control at PHONO, but be sure that the turntable motor is off and the recording arm is at the rest position. With the Volume control at the maximum gain position and ear close as possible to the speaker, note the hum level. Remove the power plug from the wall outlet and reinsert it with the prongs reversed. Again note hum level. Choose the prong arrangement which produces the least amount of hum.

AUXILIARY ADJUSTMENT

An auxiliary adjustment control (AUX 1 ADJ) (located on the chassis) is provided for adjusting the sound level of signals from auxiliary units connected to the AUX 1 input to prevent "blasting." Using a screwdriver, rotate counterclockwise to decrease gain; clockwise to increase gain.

CONNECTIONS

INTERCONNECTION OF COMPONENTS

All connections between the receiver and other units in the sound system should be made with single conductor, low capacity shielded cable to reduce the possibility of hum. No run of wire should exceed seven feet in length *(except to speaker units)* to avoid loss of high frequency response. Cables should be kept away from the other wiring, especially power lines, and should not pass near any transformers.

AUXILIARY POWER RECEPTACLES

Two auxiliary power receptacles are provided on the rear of the chassis. The unmarked receptacle supplies power to another component so that the amplifier's power switch will act as the main power switch for the entire system. (Make certain that this auxiliary component does not draw more than 2 amperes.). The other AC receptacle marked PHONO is for use with a phonograph. The power switch of the DB130 does not control this receptacle and the phonograph must be switched on and off independently.

INPUTS

TUNER: Connect any radio tuner producing a 1-volt signal to the input jack marked **TUNER.**

HIGH MAG: Connect phonographs having the following cartridges to the input jack marked **HIGH MAG:**

High level magnetic cartridges (such as Pickering, etc.) producing between 15 and 45 millivolts;

Constant amplitude cartridges (Weathers, Crystal, etc.) are to be used with Weathers Adapter Plug Model P-631;

Ceramic cartridges that equalize for RIAA curve are to be used with Electro-Voice Adapter Model 504.

LO MAG: Connect phonographs with low level magnetic cartridges with outputs between 1.5 millivolts and 15 millivolts (Fairchild, General Electric, Recoton, etc.) to the input jack marked **LO MAG.**

HI-FI XTAL: Connect phonographs having a Ronette Model TO-284P crystal cartridge to the input jack marked **HI-FI XTAL.**

AUX I and AUX 2: Connect leads from a television receiver, high level tape output, etc. to the input jacks marked **AUX I** and/or **AUX 2.**

TAPE INPUT: Connect the output from the playback head of a tape playback deck to the input jack marked **TAPE INPUT.**

TAPE MON: Connect the monitor output lead from a tape recorder to the input jack (located on the chassis rear) marked **TAPE MON.**

OUTPUTS

Tape Output: Connect the lead from the input jack of the tape or disc recorder to the output

jack (located on the chassis rear) marked TAPE OUT.

Speaker Output: The speaker(s) used with the DB130 should be connected to the terminal strip (located on the rear of the chassis) with one lead to the terminal lug marked **COM**, the other lead attached to the lug marked **A**. If an additional speaker is used, it should be attached to the lug marked **COM** and the lug marked **B**. Be sure that the speakers are the same impedances, i.e., two 16-ohm speakers or two 8-ohm speakers, and the Speaker Impedance Selector switch (located on the chassis) is set at the corresponding impedance position.

If it is desired to use a *single* 4-ohm speaker with the DB130, observe the following procedure:

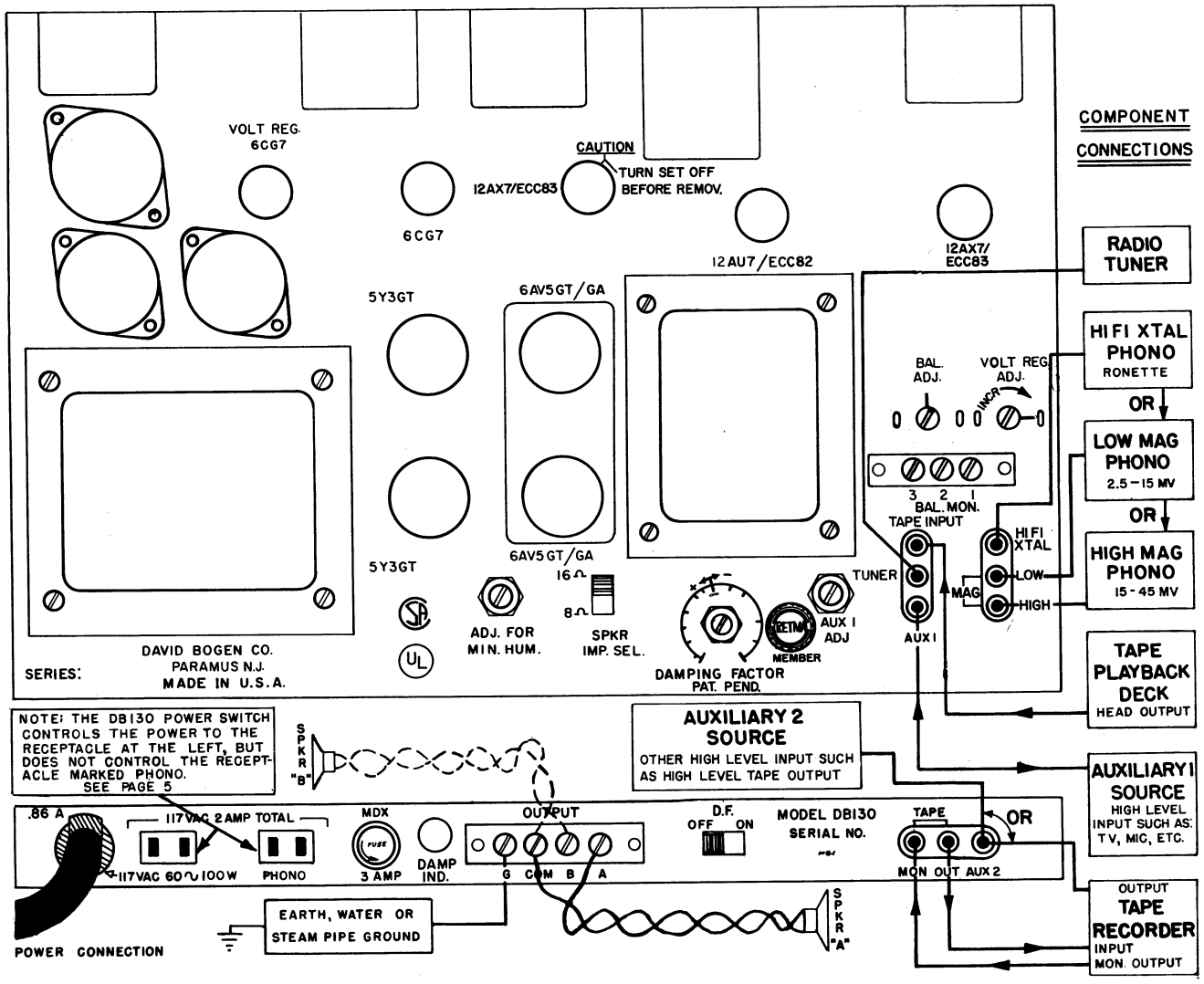
1. Connect one of the 4-ohm speaker leads to either terminal lug A or B, the other to the lug marked **COM**.
2. Set the Speaker Impedance Selector switch at the 8-ohm position.
3. Set the SPEAKER selector switch at the AB position.

NOTE: The DB130 should be "grounded" – that is, a lead connected from the terminal lug marked G to a good ground, such as a water or steam pipe. Grounding the G terminal does not constitute grounding the speaker line.

CAUTION: Do not switch the SPEAKER selector to position B if a speaker (or load) is not connected to B.

CONTROLS AND SWITCHES

Red dots have been placed at the "normal" control positions for those high fidelity neophites who are not familiar with the use of the DB130 controls.



EQUALIZER

The DB130 features a 7-position equalizer with precise curve settings for compensating virtually all 78, 45 and 33-1/3 rpm records. When in doubt as to the exact setting which should be used, it is suggested that the RIAA curve be used. A short description and complete Equalization Chart will be found in a separate section on pages 7 and 8.

LOUDNESS CONTOUR (Outer Knob marked with ○)

Almost every critical listener has noted that when an ordinary volume control is used to reduce the sound level on speech or music, the low frequencies seem to drop out as the sound level is decreased. This apparent lack of bass at low sound levels is caused by a normal characteristic of the ear that makes it less sensitive to changes in sound loudness at low frequencies than at high frequencies. Since there are considerations that make it impractical for everyone to listen to music, etc., at home reproduced at "concert level", the ideal home system should be able to control the output of sound in such a manner that the tonal balance between high and low frequencies is maintained constant at all loudness levels. The loudness CONTOUR selector does precisely that.

In order to maintain a constant tonal balance as the sound level is changed, and to derive the benefit from the loudness CONTOUR selector, it must be used as follows:

1. Determine the level of listening you anticipate, (i.e., soft, medium, or loud).
2. Set the loudness CONTOUR selector to the position corresponding to your selection. For example: if your listening habits dictate a soft level, set the control at -20 (-20db).

LOUDNESS CONTOUR SWITCH POSITIONS

db	LOUDNESS LEVEL
-30	Very Soft
-20	Soft
-10	Medium
-5	Normal (Red Dot)
0	Loud

3. Adjust the VOLUME control for whatever program material is selected, to provide the desired listening level. When adjusted, the

RECORD LABEL	POSITION
MICROGROOVE and LP RECORDS	
Allegro	COL LP
Allied	RIAA
American Rec. Soc.	RIAA
Angel	RIAA
Arizona	RIAA
Atlantic*[1]	COL LP
Audiophile(78rpm)	RIAA
Bach Guild*	COL LP
Banner	COL LP
Bartok*	NAB
Blue Note Jazz	RIAA
Boston*	COL LP
Caedmon(Before 1953)	NAB
(After 1952)	RIAA
Canyon	RIAA
Capitol	RIAA
Capitol-Cetra	RIAA
Cetra-Soria	
(Before 1953)	COL LP
(After 1952)	RIAA
Colosseum*	COL LP
Columbia*	COL LP
Concert Hall(Some)	COL LP
(Others)	RIAA
Contemporary	RIAA
Cook[1]	RIAA
Coral	RIAA
Decca(Some)	NAB
(Others)	RIAA
Dial	COL LP
Elektra*	NAB
EMS	RIAA
Epic*	COL LP
Esoteric	RIAA
Festival	NAB
Folkways*	COL LP
Good-Time Jazz	RIAA
Handel Society	COL LP
Haydn Society	
(Some)	COL LP
(Others)	RIAA
Harvard	COL LP
HMV (British)	COL LP
(American)	RIAA
L'Oiseau Lyre	RIAA
London	RIAA
Lyrichord(Some)	COL LP
(Others)	RIAA
Mercury	RIAA
MGM	RIAA
New Records	COL LP
Oceanic*	COL LP
Oxford	COL LP
Pacific Jazz	RIAA
Period	NAB
Philharmonia	RIAA
Polymusic*[1]	COL LP
Rachmaninoff	COL LP
RCA-Victor	
(Orthophonic)	RIAA
(Others)	NAB
Remington*	NAB
Renaissance	
(Some)	COL LP
(Others)	RIAA
Riverside	RIAA
Romany	RIAA
Savoy	RIAA
Stradivari	COL LP
Telefunken	RIAA
Tempo(Some)	NAB
(Others)	RIAA
Transradio	COL LP
Urania	
(Before 1953)	COL LP
(After 1952)	RIAA
Vanguard*	COL LP
Vox*	COL LP
Walden	RIAA
Westminster	
(Some)	COL LP
(Others)	RIAA

RECORD LABEL	POSITION
78 RPM RECORDS	
AMERICAN	
Alco	NAB
Artist	NAB
Asch-Stinson	NAB
Blue Note	NAB
Brunswick	EU78
Capitol	NAB
Co-Art	NAB
Columbia	NAB
Concert Hall Soc.	NAB
Continental	EU78
Compass	EU78
Decca	NAB
Disc	NAB
Friends of Rec. Music.	NAB
Gamut	NAB
General	NAB
Gramaphone Shop	NAB
Hargail	NAB
Keynote	NAB
Mercury	EU78
Musicraft	NAB
New Music Rec.	NAB
Paraclete	NAB
RCA-Victor	RIAA
Schirmer Lib. of Recorded Music	NAB
Technichord	RIAA
Timely	NAB
Vox	NAB
BRITISH	
Columbia	EU78
Decca (FFRR)	EU78
HMV	EU78
National Gramophonic Society	EU78
Parlophone	EU78
CZECH	
Esta	EU78
Ultraphon	EU78
DANISH	
Tono	EU78
FRENCH	
L'Anthologie Sonore	EU78
Bôite à Musique	EU78
Discophiles Français	EU78
Forlège	EU78
Lumen	EU78
L'Oiseau Lyre	EU78
Pathé	EU78
GERMAN	
Electrola	EU78
Odeon	EU78
Polydor	EU78
Siemens	EU78
Telefunken	EU78
ITALIAN	
Cetra	EU78
Fonit	EU78
Musica Antiche Ital.	EU78
Voce del Padrone	EU78
SWEDISH	
Musica	EU78
NOISY RECORDS	POP

* Since some time in 1954, new releases and recordings made from new masters require RIAA equalization curve.

[1] On binural records high frequency is recorded flat on the inside band.

This Record Equalization Chart gives the recording characteristics of virtually every commercial label. To facilitate rapid and accurate adjustments, purchasers of the unit are advised to clearly mark all their records with the proper equalization settings, tone control variations, and preferred volume levels.

CUT OUT AND POST FOR READY REFERENCE

amount of correction provided by the DB130 will be proper. If the listening conditions change, reset the loudness CONTOUR selector for the new level desired.

VOLUME (Inner Knob marked with •)

Clockwise rotation increases the intensity of output of the amplifier; however, this control has *no effect* on the output to a tape recorder from the TAPE OUTPUT receptacle.

INPUT SELECTOR

This 5-position control is used to select various input circuits for other units in the system. The positions are as follows: **PHONO**--for an input from any type of phonograph; **RADIO**--for input from a radio tuner; **TAPE**--for input from a tape playback head; **AUX 1** and **AUX 2**--for high level inputs from a television receiver, tape recorder, etc.

BASS (Outer Knob marked with ○)

Clockwise rotation increases bass response; counterclockwise rotation beyond mid-point decreases bass response—both without interaction with the TREBLE control. Mid-position (marked FLAT) of this control provides flat bass response. Start all adjustments with this control in mid-position. This control has *no effect* on the output to a tape recorder from the TAPE OUTPUT receptacle.

TREBLE (Inner Knob marked with •)

Clockwise rotation beyond the mid-point increases treble response; counterclockwise rotation beyond mid-point decreases treble response. Mid-position (marked FLAT) of this control provides flat treble response. Start all adjustments with this control in mid-position. This control has *no effect* on the output to a tape recorder from the TAPE OUTPUT receptacle.

POWER

Turns power on and off of both the DB130 and the unmarked auxiliary power receptacle at the rear of the amplifier. The pilot light will illuminate when the set is on.

Lo FILTER

The DB130 low frequency filter control minimizes low frequency noise, distortion and rumble. Three positions are provided: **F**—for flat response; **50** and **100**—for filtering low frequencies below 50 and 100 cycles respectively.

Hi FILTER

The DB130 high frequency filter control minimizes high frequency distortion and noise. Three positions are provided: F—for flat response, 4 and 8--for filtering high frequencies above 4 and 8 kilocycles respectively.

MONITOR

When the tape MONITOR switch is in the ON position, the operator can monitor the signal on the recording tape while making the recording. This enables the operator to detect imperfections in the tape signal as they occur.

With the tape monitor switch in the OFF position, the operator can monitor the signal being "taped" by the recording head.

Refer to the illustration on page 6 for the correct wiring connections.

SPEAKER SELECTOR

The DB130 features a 3-position SPEAKER selector switch with the following positions: A--for speaker A; B—for speaker B; AB—for speakers A and B.

SPEAKER IMPEDANCE SELECTOR

The 2-position speaker impedance selector (located on the chassis) can be set for either 8- or 16-ohm speakers or a single 4-ohm speaker. See the Speaker Output paragraph in the section on output connections (Page 6) for additional information on the use of speakers.

DAMPING FACTOR

The exclusive DAMPING FACTOR control incorporated in the new Bogen high fidelity amplifiers is capable of adjusting the amplifier damping factor over an enormously wide range: from less than +0.1, through infinity, to over -1.5. This is equivalent to adjusting the amplifier source resistance from over +160 ohms through zero ohms to less than -9 ohms. Correct use of this feature means that the sound quality of *any* speaker may be optimized. With an average speaker, the very low positive settings will generally result in exaggerated bass and treble response from the speaker. The intermediate settings will prove to make the speaker behave in much the usual way. Settings in the low negative region will greatly reduce both speaker resonances and speaker distortion if the speaker system is horn loaded throughout its range. If the speaker is not loaded in this manner, the greatest reduction in distortion and resonances will be realized in the low-frequency range.

The DAMPING FACTOR control *is to be adjusted to the setting that sounds best to the listener.* Room acoustics, speaker deficiencies and listener preference will dictate the correct setting, but experience has shown that with many speakers, the greatest benefits are derived from settings approaching ultimate damping. Ultimate damping is achieved when the source resistance of the amplifier is adjusted to a negative value that will almost cancel out the dc resistance of the speaker voice coil. This is the resistance that isolates the motional impedance (or the "business end") of the speaker from its driving source.

This revolutionary new control maintains constant negative feedback throughout its range and employs no filters to correct the response of the speaker. If a slight loss in bass response results from use of low negative settings, it may be readily brought back into proper balance by use of the BASS tone control.

The effect of the new variable damping factor control will be a revelation to the listener regardless of the speaker being used.

To adjust for ultimate damping, observe the following procedure:

1. Set the VOLUME control for minimum gain.
2. Set the DAMPING FACTOR control completely counterclockwise.
3. Turn the DF switch to the on position and leave it ON.

   NOTE: If it is desired to use the DAMPING FACTOR control, do not connect external ground on any speaker output connection from another amplifier to COM on the DB130 output terminal strip.
4. Using a screwdriver, slowly rotate the DAMPING FACTOR control (located on the chassis rear) in a clockwise direction until the damping indicator (DAMP. IND.) bulb flashes

   CAUTION: Allow the speaker to oscillate only momentarily. Violent vibration could be detrimental to the suspension system of the speaker.

5. Slowly rotate the DAMPING FACTOR control counterclockwise until the damping indicator bulb stops flashing.

If two speakers are to be used with the DB130, make the above adjustment with the SPEAKER SELECTOR set at position AB so that speakers will be connected. It is normal for the DAMPING INDICATOR bulb to flicker while program material is being reproduced.

To check the adjustment, follow the procedure listed below:

1. Feed a program source into the amplifier (radio, phonograph, etc.) and turn up the VOLUME control to the loudest anticipated listening level, then turn it full counterclockwise to minimum volume (so as to send a signal pulse through the speaker) while carefully observing the damping indicator.
2. If the indicator flashes **after** volume has been reduced to zero, turn the DAMPING FACTOR control further counterclockwise and repeat the test, adjusting the DAMPING FACTOR control until no flashes occur. Do not confuse the flashing of the indicator with the flickering produced by the presence of a signal.

NOTE: Some speakers have higher DC voice coil resistance than others, or may produce different phase shifts. In either case no oscillation will occur. If the voice coil DC resistance is greater than about 9 ohms, the control should be adjusted to the extreme clockwise position.

SERVICE INSTRUCTIONS

If the DB130 requires service, it is advisable to call a Bogen distributor, either for service or to recommend a technician who is qualified to perform such work.

TUBE REPLACEMENT

Tubes should be tested for condition at least every six months if the DB130 is operated regularly, in order to insure optimum high fidelity performance. All tubes are readily accessible from the rear. Care should be taken when removing the tubes and reinserting them; the tubes should be handled by the bases only. When replacing a tube, try to check a number of new replacements and choose the one which gives the least amount of noise or hum.

OUTPUT STAGE BALANCING

The power output stage has been balanced at the factory for the two 6AV5GT/GA tubes supplied with the DB130. If either of these tubes is replaced or inadvertently interchanged or the 6CG7 voltage regulator tube is replaced, the stage must be rebalanced. This adjustment does not require removing the bottom plate of the set. Proceed as follows:

1. Using a screwdriver, turn the VOLT. REG. ADJ. and the BAL. ADJ. controls full counterclockwise.
2. Rotate the VOLUME control full counterclockwise, turn the POWER switch on, and allow 4 minutes for the set to warm up.
3. Remove the two shorting straps from the BAL. MON. terminal strip and connect the probes of a DC voltmeter capable of accurately measuring 1.5 volts to test points 1 (+) and 2 (-).
4. Adjust the VOLT. REG. ADJ. control for a *1.5-volt* meter reading.
5. Transfer the negative probe from test point 2 to test point 3 and adjust the BAL. ADJ. control for a meter reading of *zero volts*.
6. Replace the two shorting straps on the BAL. MON. terminal strip (Short 1 and 2; short 2 and 3).

NOTE: If set owner finds it impossible to have a qualified serviceman balance the output stage in the preferred manner when the output tubes are replaced, he can approximate balance by lining up the slots of the VOLT. REG. ADJ. and BAL. ADJ. controls with the indicator marks adjacent to each of the control adjustment holes.

FUSE REPLACEMENT

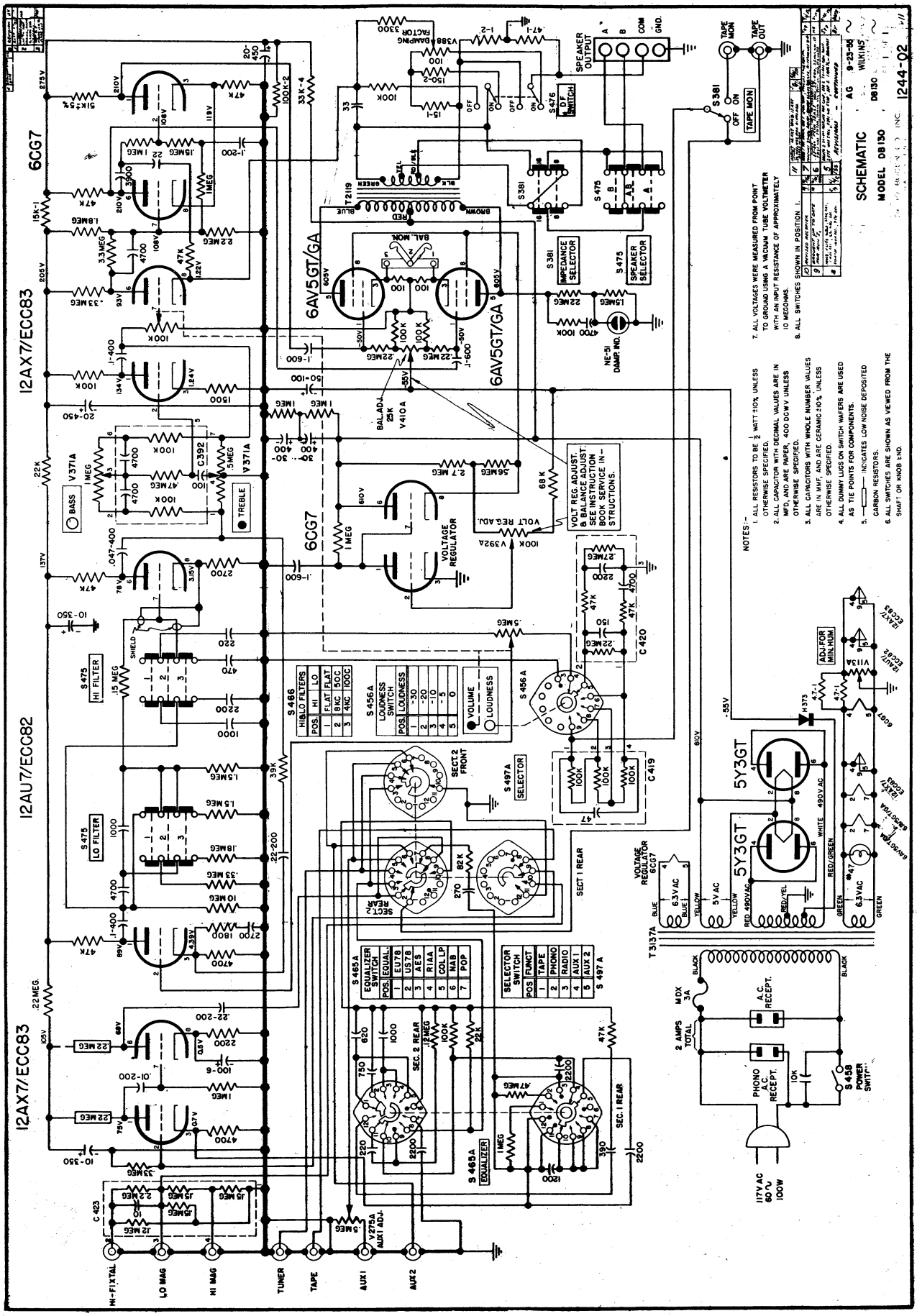
A three-ampere slow-blow type fuse is located on the rear of the chassis. To replace this fuse press spring-loaded cap slightly inward, rotate counterclockwise and withdraw cap and fuse. Use only a three-ampere slow-blow type fuse for replacement. If a second fuse blows examine the amplifier thoroughly for indications of short or component failure. If no failure can be located do not attempt to further operate the unit. Consult an experienced technician for inspection of the amplifier.

PILOT LIGHT REPLACEMENT

To remove the pilot light for replacement reach in over the tubes to the front of the chassis, remove the bulb by pressing inward and rotating counterclockwise slightly. Use a #47 bulb for replacement.

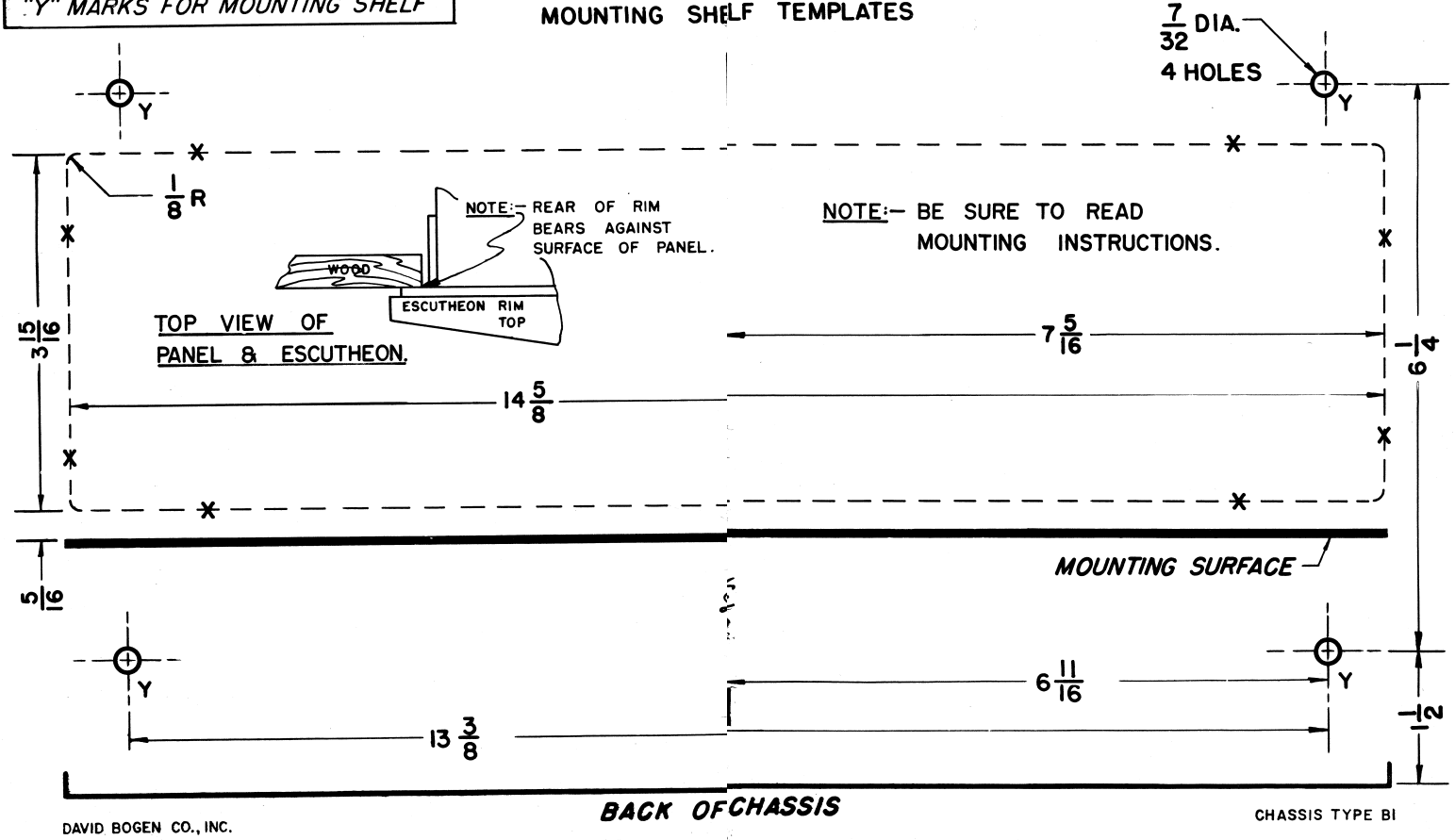
UL AND CSA APPROVAL

This equipment has been examined and tested by the Underwriters' Laboratories, Inc. and the Canadian Standards Association and has been found to comply with the requirements of these organizations for products of this type.


SCHEMATIC
MODEL DB130
1244-02
WILKINS
12AX7/ECC83
12AU7/ECC82
6CG7
6AV5GT/GA
5Y3GT
SPEAKER OUTPUT
TAPE MON
TAPE OUT
S381
S475
S476
S466
S456A
S456 A
S497A
S465A
S458
V371A
V392A
V410A
V373
V275A
C392
C420
C419
C423
BASS
TREBLE
VOLT REG. ADJ.
BAL. ADJ.
IMPEDANCE SELECTOR
SPEAKER SELECTOR
VOLTAGE REGULATOR
HI FILTER
LO FILTER
VOLUME
LOUDNESS
SELECTOR
EQUALIZER
POWER SWITCH
A.C. RECEPT.
PHONO A.C. RECEPT.
117V AC 60~ 100W
2 AMPS TOTAL
HI-FI XTAL
LO MAG
HI MAG
TUNER
TAPE
AUX1
AUX2
NOTES:-
1. ALL RESISTORS TO BE ½ WATT ±10% UNLESS OTHERWISE SPECIFIED.
2. ALL CAPACITOR WITH DECIMAL VALUES ARE IN MFD, AND ARE PAPER, 400 DCWV UNLESS OTHERWISE SPECIFIED.
3. ALL CAPACITORS WITH WHOLE NUMBER VALUES ARE IN MMF, AND ARE CERAMIC ±10% UNLESS OTHERWISE SPECIFIED.
4. ALL DUMMY LUGS ON SWITCH WAFERS ARE USED AS TIE POINTS FOR COMPONENTS.
5. —/\/\/— INDICATES LOW NOISE DEPOSITED CARBON RESISTORS.
6. ALL SWITCHES ARE SHOWN AS VIEWED FROM THE SHAFT OR KNOB END.
7. ALL VOLTAGES WERE MEASURED FROM POINT TO GROUND USING A VACUUM TUBE VOLTMETER WITH AN INPUT RESISTANCE OF APPROXIMATELY 10 MEGOHMS.
8. ALL SWITCHES SHOWN IN POSITION 1.

CAUTION
"X" MARKS FOR FRONT PANEL
"Y" MARKS FOR MOUNTING SHELF

SUPERIMPOSED FRONT PANEL AND MOUNTING SHELF TEMPLATES



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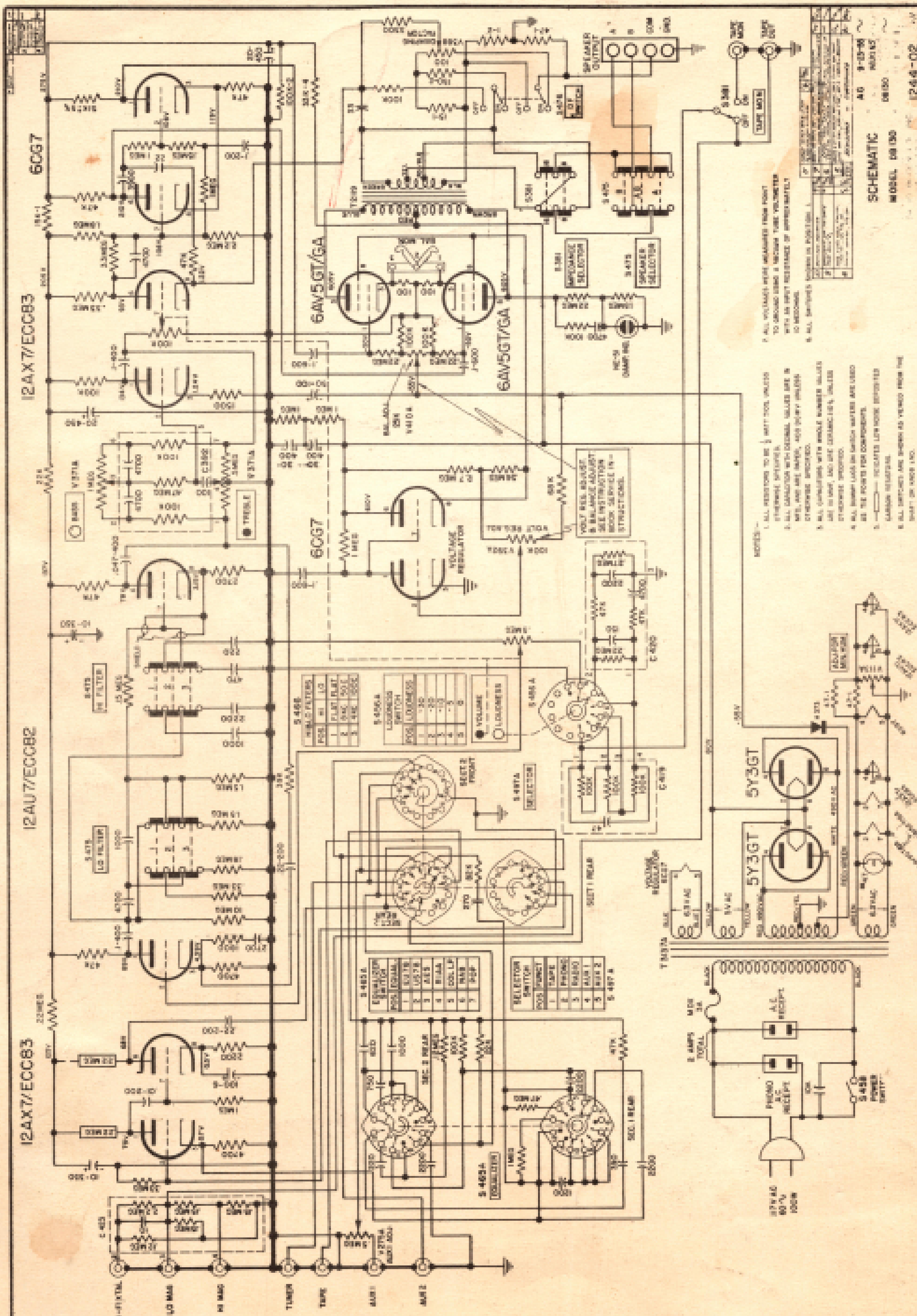
CHASSIS TYPE BI



SCHEMATIC
MODEL DB130
1244-02
6CG7
12AX7/ECC83
12AU7/ECC82
6AV5GT/GA
5Y3GT