

1. Full Consolidated Schematic (Text Form)

Power Supply & Rectifier

- Mains (IEC inlet) → 2 A slow-blow fuse → SPST Power switch → PT primary.
- PT secondaries: HT ~385-0-385 V (or 350-0-350 range) @ ~100 mA+; 5 V @ 3 A (rectifier heater); 6.3 V CT @ 4 A+ (tubes).
- Rectifier: V7 = 5U4GB (socket) **or** solid-state diodes (rear DPDT/SPST switch selects Tube or SS mode; add dropping resistor in SS path to match voltage).
- Standby: DPST switch opens B+ path after rectifier.
- Filtering (star ground on negatives):
 - After rectifier: 20 μ F/450 V (reservoir) → 5–10 H / 100 mA choke → 20 μ F/450 V (**B+1** power amp).
 - → 10 k Ω / 2 W → 20 μ F/450 V (**B+2** PI).
 - → 22 k Ω / 2 W → 30 μ F/450 V (**B+3** preamp/loop).
- Bleeder resistor on first cap (e.g., 220 k Ω / 2 W).
- Heater elevation: ~25–40 V DC (divider from B+).
- All heaters: 6.3 V (twisted pairs); elevate preamp tubes.

Preamp – V1 (6SL7 octal)

- Input jack (switching, far left front) → 68 k Ω grid stopper → Pin 2 (grid of first triode / V1a).
- V1a: Pin 1 (plate) → 120 k Ω / 1 W to B+3.
- Pin 3 (cathode) → 1.5 k Ω / 1 W + 25 μ F/25 V bypass to ground.
- Coupling: 0.022 μ F/400 V from Pin 1 → Gain pot (1 M Ω audio taper, front panel) wiper.
- V1b (second triode): Similar topology or direct cascade from Gain (standard values; plate ~100–120 k Ω to B+3, cathode adjusted for voicing). Coupling out 0.022 μ F to tone stack input.
- Grid leaks on stages: ~1 M Ω where appropriate.

FMV TMB Tone Stack (Bluesbreaker-voiced)

- From Gain wiper / preamp output → tone stack input.
- Bass pot (1 M Ω audio): Top to input path; bottom via 0.022 μ F to ground.
- Mid pot (25 k Ω linear) between bass wiper and 0.022 μ F to ground.
- Slope resistor: 33 k Ω / 1 W to Treble pot (500 k Ω audio) top.
- Treble wiper → 500 pF to bass wiper path; bottom to ground.
- Output from Treble wiper → 0.022 μ F coupling to next stage (loop send buffer grid).

Buffered FX Loop (Series) – V2 & V3 (12AX7 9-pin)

- From tone stack output → V2 (cathode follower send buffer).
 - V2a or appropriate half: Grid input; cathode output (via resistor ~10–47 kΩ) to Send jack (rear panel). Plate to B+ (or resistor).
- Effects Send jack → your time-based pedals (Empress ParaEQ, Tape Delay, Lexicon) → Effects Return jack (rear) → Trim pot (1 MΩ audio, rear panel) → coupling cap → V3 grid (recovery / common cathode stage).
- V3: Plate resistor ~100 kΩ to B+; cathode ~1.5 kΩ (bypassed); output coupling cap to Master Volume input.
- Master Volume (front panel, 1 MΩ audio or log) wiper → coupling to PI input.

Phase Inverter + NFB + Presence – V4 (12AT7 9-pin LTP)

- Input from Master → 0.022 μF coupling → 1 kΩ stopper → Pin 2 (grid) + 1 MΩ grid leak.
- Plates: 82–100 kΩ / 1 W from B+2 to Pins 1 & 6.
- Cathodes tied (Pins 3 + 8) → 22–27 kΩ / 2 W tail resistor to ground (optional small bypass).
- Outputs: From Plates via 0.1 μF coupling caps + grid stoppers (1–5.6 kΩ) to KT66 grids. Grid leaks ~470 kΩ–1 MΩ.
- NFB: OT secondary hot (selected tap, e.g., 8 Ω) → 47–100 kΩ / 1 W resistor to cathode junction + SPST “Raw” bypass switch.
- Presence (front panel): Cathode junction → 0.047–0.1 μF cap + 4.7 kΩ fixed + 5–10 kΩ linear pot to ground.

Power Amp – V5 & V6 (KT66 octal, enhanced cathode bias, push-pull)

- Grids driven from PI outputs (as above).
- Plates → OT primary ends (center tap to B+1).
- Screens: B+1 via 100 Ω / 2 W resistor each.
- Cathodes (separate per tube): ~500–600 Ω / 5–10 W wirewound resistor + 100 μF/100 V bypass cap each → 1 Ω 1% sense resistor to ground.
- Labeled test points at each sense resistor (mV reading = mA bias current).
- OT secondary → Impedance switch (4/8/16 Ω) → Speaker jack (rear).

Controls & Jacks Summary

- **Front:** Input (far left), Gain, Treble/Middle/Bass (FMV stack), Master, Presence, Standby, Power.
- **Rear:** FX Send/Return + Trim pot, Speaker out, IEC inlet, Rectifier mode switch, Impedance selector, Bias test points.

Notes on Schematic

- All coupling caps are film (e.g., 0.022 μ F, 0.1 μ F, 500 pF as specified).
- Use quality components (Jupiter/Mallory film, F&T/Nichicon electrolytics, metal film or carbon comp resistors per path).
- OT primary impedance: Target \sim 6.6–8 k Ω (as suitable for your Mojotone/ClassicTone JTM45-style recommendation and cathode-biased KT66 pair).
- Verify all voltages on build; adjust dropping resistors for target B+ per rail.

This is a complete, working schematic ready for DIYLC or manual drawing.

2. Detailed Layout Diagram Description (for DIYLC or Turret Board)

Chassis: Aluminum or steel, \sim 22–26" wide \times 8–12" deep \times 2–3" high. Bottom-mounted in head cabinet; tubes top-mounted through cutouts with ventilation. Rear access excellent for transformers.

Tube Placement (single straight row near front edge of chassis top, left to right):

- Input jack area (far left) \rightarrow V1 6SL7 (octal socket).
- V2 12AX7 (9-pin) \rightarrow V3 12AX7 (9-pin) for loop.
- V4 12AT7 (9-pin) for PI.
- V5 & V6 KT66 (octal sockets, right end of row).
- V7 5U4GB rectifier socket (near PT or rear).

Transformers & Choke (mounted on rear portion of chassis top, behind the tube row for easy back access):

- PT: Rear-left or center-rear.
- Choke: Near PT.
- OT: Rear-center or right-rear (short leads to power tubes and speaker jack).

Turret / Eyelet Board Layout (under chassis):

- One or two boards: Main signal board + separate PS board if preferred.
- **Signal flow left-to-right or front-to-back:**
 - Forward section: V1 preamp + tone stack components + Gain pot wiring.
 - Central: FX loop (V2/V3) stages + Master Volume.
 - Rear/PI cluster (your excellent tip): Group V4 PI + NFB resistors/switch + Presence components tightly together near OT and KT66 sockets. Short leads here minimize noise and hum; makes tweaking NFB/Presence easy.
 - Power section: Cathode bias resistors, sense resistors, test points, screen resistors near KT66s.

- Eyelets/turrets for every node. Use shielded cable for sensitive runs (e.g., to PI grids or FX return). Twisted heater pairs throughout.
- Grounding: Single star ground point (or buss). Connect all grounds cleanly; avoid loops.
- Label everything: Tube pins, B+ rails, test points, pot lugs.

Wiring & Practical Tips:

- Short/direct wiring in the PI + NFB + Presence cluster.
- Keep AC (heaters, PT) away from signal paths.
- Good ventilation in cabinet (top vents + open/meshed back).
- Mount sockets securely; use ceramic where possible.

DIYLC Workflow:

1. Open new project → Schematic view.
2. Place tube symbols (6SL7 octal, 12AX7/12AT7 9-pin, KT66 octal, 5U4GB).
3. Draw connections and drop in your exact component values from the schematic above.
4. Switch to Layout view → Position sockets in the single row as described.
5. Place turret board symbols or eyelet strips; route components.
6. Add PT/OT/choke symbols in rear positions.
7. Add pots, jacks, switches on front/rear panels.
8. Print or export for reference. Many users share DIYLC files on Amp Garage or similar forums.

Recommended Next Steps & Parts Summary

- **Transformers:** Mojotone or ClassicTone (Heyboer-made) JTM45/Ampeg-style PT + OT (KT66-optimized taps) + matching choke
- **Tubes:** 6SL7, two 12AX7, one 12AT7, matched KT66 pair, 5U4GB.
- **Other:** Quality sockets, turret board or eyelet strips, Alpha/CTS pots (tapers as specified), robust switches/jacks, film caps, electrolytics, resistors (mix of types per notes).
- **Build order:** Power supply & heaters first (verify voltages). Then preamp stages. Add tone stack, loop, PI, finally power section. Test incrementally with variac/current limiter.
- **Safety:** High voltages present. Bleeders, proper fusing, discharge caps, insulated tools/wiring. Bias monitoring via your sense resistors is a big plus.

It should produce a dynamic, great-sounding ~25–35 W head with the warm 6SL7 character, interactive Bluesbreaker-voiced EQ, transparent buffered loop for time-based effects, and classic cathode-biased KT66 power with easy maintenance features.