

# icon Audio

## Instruction Manual Covering: **Stereo 20 SE**

**Special Edition  
Fitted With Jensen  
Paper in Oil Capacitors**

**IMPORTANT!  
THIS MANUAL CONTAINS  
ESSENTIAL HEALTH &  
SAFETY INFORMATION FOR  
YOU AND YOUR AMPLIFIER.  
PLEASE READ & KEEP SAFE  
AND REFER TO IF NECESSARY**



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## **1 Introduction**

Thank you for purchasing the **Stereo 20SE**. A great deal of care has been taken in the design, selection of components and production of this amplifier. We are sure that you will hear the difference.

In order to get the best out of your amplifier, please read the enclosed notes. Even if you are experienced with hi fi **Please read the 'quick set up guide'**. Should you be uncertain about anything to do with your amplifier please contact us for advice.

Hi fi reproduction is a long chain of events that includes the recording, editing, mixing etc, before being transferred to a medium such as LP, CD, or FM, before being played through your own source unit, the amplifier and finally loudspeakers.

Your room acoustics will also affect the sound before it finally reaches your ear. Whilst the amplifier is arguably the most important part of a system, it is important to remember that the weakest link will always affect the final results when making judgements. And not all recordings are 'equal'! Therefore an amplifier which faithfully reproduces the input signal will also reproduce imperfections in the tonal balance and the recording itself. Therefore setting up and judgements should be made with a 'clean' well balanced recording.

The **Stereo 20SE** is a single ended Ultralinear stereo power amp. Using only one output tube per channel. This makes for a very simple design without the complexities of push-pull operation. The biggest problem with single ended designs is their low power and often poor bass performance.

Developed over several years our primary goals were: 1, To have enough power to drive modern speakers to a good level. 2, Warm, yet detailed sound without "soggy bass". 3, Not requiring a large expensive power supply. To avoid expensive tube replacements. 4, Relatively simple all triode drive stage for purest sound. 5, To use a valve rectifier for extra smoothness. 6, Reliability and simplicity of operation.

The excellent GEC KT88 fits all these requirements with ease.

The pre-amp is a high quality 'Passive' circuit using silver audio cable and an ALPS 'blue' volume control. It is sensitive enough to be used with all modern source equipment having an output of 300mv or greater. Its simplicity coupled with point to point hand wiring without the use of printed circuit boards results in an open euphoric sound that is wonderfully detailed and warm sounding.

## **2 Final Inspection - Your Guarantee of Quality**

*To assure you of optimum performance and reliability, this amplifier has passed our rigorous final inspection and listening test by the Icon Audio team in Leicester . During which the final set up and adjustments were made.*

Date ...../...../.....

Model .....

Amp Serial Number .....

Customer .....

Check amplifier finish	.....	HT fuse (internal)	T630ma
Internal wiring check	.....	Sales invoice	.....
Check Triode mode	N/A.....	Bottom label	.....
Run min 6 hour test	.....	Credit card receipt	.....
Check inputs	.....	Customer survey form	.....
Output Valve Bias level	.....mv	Bias meter	.....
Sound Quality	.....	Transformer Protection	.....
Channel Balance	.....	<b>Upgrades:</b>	
Valve Microphony	.....	HT delay fitted?	...Y / N
Valve Seating	.....	Output valves	.....
Hum level left/right	...../.....mv	1 <sup>st</sup> Stage valve	.....
RF Test	.....	Phase splitter valve	N/A.....
LED brightness	.....	Triode conversion	.....
Serial No sticker and recorded	.....	Mains lead	.....
Mains voltage	110 / 240V	Interconnects	.....
IEC Mains Fuse	.....A	Remote control tested	.....

Signed off by .....

Notes:

Please note we do not test the standard mains lead.

## **IMPORTANT READ THIS FIRST**

### **2 QUICK SET UP GUIDE**

**1 Unpack unit carefully.** Make sure that it is in good condition. If not report to Icon Audio. It is important that you keep packaging for warranty/service return. Rubber feet are supplied to protect delicate surfaces. These may be removed if not required.

**2 Valve Fitting.** The KT88s should be fitted first observing the numbers 1 & 2, on the rear of the valve; this corresponds with the four numbered sockets from left to right viewed from the front. This is essential as each valve was 'set up' in this position. **Do not push or pull the KT's by the glass envelope**, this could cause the glass envelope to come loose from the base.

The small valves are normally numbered 3 & 4, and should be gently pushed into place. It is normal for them to feel a little loose after insertion.

The middle rectifier valve (5) should be fitted in the same way.

**3 Connect to source units**, e.g. CD, Tuner, Tape, Phono pre amp (if used) etc via appropriate phono sockets.

**4 Connect to speakers** making sure that the correct impedance (ohms) is chosen, (see back of speakers). Most modern speakers are 4ohms. Don't forget to get the correct polarity of speaker cables. (See speaker connections chapter). If 'bi-wiring' both 'common' should go to the black terminal, and both 'positive' (or red) should go to either 4 or 8 ohm terminals. Do not use 4 and 8 ohm at the same time.

**5 Connect to mains** supply using supplied IEC mains lead to 240v supply. **If for some reason the welded plug must be removed, please remove fuse and dispose of immediately.** (As they can be a danger to children if plugged in). The replacement plug should be wired in the following way Brown to Live terminal, Blue to Neutral terminal and Green/Yellow to Earth terminal.

**6 SWITCH ON!** The blue mains indicator should light up and unit will take approximately 40 seconds to start working. All valves should have a visible orange glow from the cathode heaters. With the volume control set to minimum (fully anti-clockwise) there should be no sound coming from the speakers except a barely discernable gentle hum. If there are any unpleasant sounds coming from the speakers, switch off and

refer to the 'Trouble Shooting' section or contact Icon Audio.

This amplifier uses a vacuum tube rectifier to obtain the High Tension voltage. This requires about 30 seconds to start working. With the advantage that it also acts as a delay in gently applying the HT to the audio valves, thereby protecting them from sudden HT "shock".

**7 Your unit should now be functioning.** If not check wiring again and use selector/tape monitor/volume to choose source program and suitable listening volume. Do not operate at a high volume for the first five minutes to allow the valves to warm up properly.

#### **Please note these things are normal for valve amplifiers:**

A, Valves can get very hot, BEWARE!

B, The transformer cover will get quite warm

C, The amplifier may smell for a few weeks.

D, Mobile phone 'breakthrough' is normal.

E, Valves may make a 'tinkling' sound when warming up and cooling down.

F, One channel may come on before the other at switch on.

G, The volume control under some circumstances may sound 'Scratchy', this is not a fault!

H, There may be a 'click' when switching off.

**8 Health and Safety.** The valves when operating have high surface temperatures. Keep out of reach of children and pets. The use of the supplied guard is recommended in these circumstances. Always unplug when making adjustments. **Like all amplifiers there are potentially lethal high voltages inside (over 400v DC), which when switched off can take twenty minutes to discharge!** Do not remove bottom panel unless you are a competent engineer. There are no user serviceable parts inside. **Like other household electrical appliances do not leave unattended whilst switched on.** Do not adjust the KT88 grid bias pre sets without reference to the manual. Incorrect adjustment could cause the valves to overheat, with resulting damage to valves and amplifier.

**To maintain the best performance of the amplifier you should check the bias of the output valves from time to time (say twice a year). Full details will be found in section 7.**

### 3 Connecting inputs & outputs

Many problems associated with electronic equipment involves connecting leads, which are usually either **'BAD CONNECTION' or a 'WRONG CONNECTION'**. So it's worth making sure that you have good connections and that your leads are the right way round.

#### Inputs

The amplifier will work with any standard piece of hi fi e.g. CD, Tuner, Tape Deck, Mini Disc, TV, Video Recorder, DVD etc having an output of 300mv or more, to get full power.

If you wish to use a turntable you will need a suitable phono pre-amp. Your dealer or Icon Audio can advise you. Our new PS1 MM/MC all valve phono stage is an ideal partner.

**To use as a power amplifier.** The ST20SE can be used as a power amplifier with a volume control. This is achieved by using the integrated/power switch at the rear of the unit. In the power position the volume control will be virtually invisible to the pre-amplifier if it is in the fully clockwise position. If you have too much gain, "back off" the volume no more than necessary. If you still have too much gain Icon Audio can modify the sensitivity to your specification. If required the remote control for the volume can be disabled, (contact us for information)

#### Connecting a tape deck. (Or CDRW/MP3 etc)

The STEREO 20SE will playback any tape deck having suitable output, It is not possible to record with this amplifier, unless you connect directly to the output unit.

#### Connecting loudspeakers

It is important to use good quality loudspeaker cable. This should be relatively thick and multi-stranded. i.e. QED 'Original' or better. Take care to connect the correct polarity. The use of 'Banana plugs' or 'spade' connections will ensure a good connection whilst minimising the risk of 'shorts'.

In our experience Icon valve amplifiers are more tolerant of cables, therefore the benefits of some very 'exotic' cables may be less apparent. But this is also personal taste.

As all cables have losses, keeping the speaker cables short is best. It may be better and be cheaper to re-arrange your room and use shorter cables than to spend a fortune on longer cables!

You can either 'hard wire' your cable to the amplifier by baring enough cable to fit in the connector and twist together to avoid any spare

strands touching anywhere else (soldering the stands together helps).

**Be warned this amplifier does not have an output protection device, which would degrade the sound. So a prolonged short due to strands of wire touching could cause damage.** Alternatively use good quality 'banana' plugs or spade connections, once fitted they are trouble free.

**Speaker polarity.** It is essential that you observe the polarity of the terminals; they must be the same for the left/right connections at the amplifier end and at the loudspeaker end. Otherwise the sound will be 'out of phase' with the sound stage 'inside out' with reduced bass. **If you are unable to check this or confirm the polarity** (e.g. if you have 'built in' wiring), try the following; Connect the system up and play some music with plenty of bass (e.g. dance music), preferably in mono (FM tuners are usually switchable to mono) and stand the speakers close together. If correct you should hear plenty of bass, if not **reverse the terminals for one channel only, either at the amp or speaker.** You will now hear more, or less bass. The higher bass output is the correct setting to use. Another alternative is to use a test disc. If you are 'bi-wiring' your speakers only two terminals, you must use only 4 or 8 ohms, not both, as this will not load the amplifier properly.

The STEREO 20SE is designed to work with full range, medium to high efficiency having impedance of 4 ohms to 8 ohms. Speakers having efficiency of lower than 86db will have greater difficulty in providing a high sound level. But this will also depend upon individual speakers, room size, type of music and positioning etc.

**Speaker impedance.** It is important to use the correct speaker impedance terminals, as this will give the best sound quality and power matching. If using 15-ohm speakers use the 8-ohm connections. If you are unsure or "6 ohms" or "4 to 8 ohms" is quoted; a rule of thumb guide is to try both positions. The loudest being the best match. Although your personal taste should be the final deciding factor.

Do not connect to more than one pair of terminals for each channel. If two pairs of speakers are required to be connected, they must both be 8-ohm and connected 4 ohm terminals. Contact Icon Audio for more information. Damage could occur if care is not taken.

## 4 How to get the best out of your amplifier

- Do not leave the amplifier switched on all the time. This is not necessary
- Do not switch off and on without a short rest of 60 seconds (to avoid a current surge)
- Do not adjust the output valve grid bias unless you know how
- Do not swop the valves round as this will damage the amplifier, and may be dangerous
- Do not operate the amplifier without loudspeakers connected
- Do not use valves other than listed as there could be danger of shock or damage
- Make sure the speakers are in phase.
- Use the best possible source material.
- Use efficient, well-designed speakers.

### What is safe maximum volume?

The Stereo 20SE will run happily all day long at maximum power; the valves are not stressed any more at full power than at zero volume. Running into gross distortion will however stress the whole amplifier. To find the maximum safe volume, play full range music and advance the volume until distortion occurs, (this is normally between 12 and 3 o'clock on the volume control) back off the volume control about 30 degrees, this is approximately full music power. However this position will vary according to the level and type of music and the output of the source unit. For example CD players tend to be higher than say tuners.

### Leaving the amp switched on

People sometimes ask if the amp should be left running 24/7 without switching off. Whilst the amplifier will sound at its best when it is properly warmed up, there is no advantage leaving it switched on when it is not in use. It is using electricity and as valves have a finite life. Conversely the valves and other components are stressed more at switch on; therefore do not switch on and off unnecessarily.

**We would always advise that any item of home electronics is switched off when not in use**

### 'Burning in'

Although the amp should sound good within about 10 mins it can take up to an hour to sound at its best and will take several months of regular use before it is fully 'run in'.

### Upgrading Valves!

This can be a controversial subject, but in our opinion quality valves always sound better, have a better service life and maintain their performance longer. The upgrade valves supplied with selected models are the result of careful comparison with other makes.

### Cabinet Care

To remove dust we suggest gentle brushing of the polished stainless steel cabinet with a soft paintbrush. Other marks can usually be removed with a damp cloth. The Perspex valve cover may need a gentle wipe with soapy water and drying with a duster. On no account use anything wet on the amplifier, and always clean with the power disconnected.

## 5 Trouble Shooting

### Amplifier Dead

Check the 20mm mains fuse at the back of the amplifier. To gain access, remove the mains lead. The fuse is in a small plastic drawer, which forms part of the socket assembly. To open insert a flat blade screwdriver or similar and prise open. **The fuse in use is the innermost** the outer is a spare. Should the replacement fuse also blow there is a fault you should disconnect from the mains and seek qualified help or Icon Audio. Replacements should be the correct type 'anti-surge'.

The fuse in the wall plug should be a 3 or 5 amp fuse, although unlikely to fail, this should be checked if the amplifier fuse is OK.

### No sound

Have you selected the right input? Are the connections OK? Is everything switched on? Are the speakers connected? If the KT88's are only just hot check the internal T630ma fuse inside.

### Distorted sound.

Try another source; if sound improves then it's probably something wrong with the first source. If

no improvement try different speakers, if no improvement could be an amplifier problem.

### Hum Problems

If you experience hum, try disconnecting all inputs, if hum persists this is probably an amplifier fault.

If not, identify which input is causing hum. Connect one input at a time. A common cause is a 'hum loop' caused by having too many earths, and may be identified by unplugging each input source from the mains. One remedy for this is to use an interconnect which only has the screen connected at one end. Other causes of low-level hum can be from adjacent equipment, so experiment with moving equipment around to see if this makes the hum better or worse.

### One channel missing.

Usually 'bad' connection on either the input or the speakers. Try swapping the connection over to establish if the cause is:

(a) Input to the amp. Sound will move to the other channel.

(b) Amplifier or speakers. Sound will not move.

If you have connected both a known good input and a known good speaker to a particular channel without success the fault is probably within the amplifier.

### Strange noises coming from speakers

Turn volume to minimum on unused input, if the noise disappears, the fault is with the source or the connection. If noise persists, the problem is with the amplifier.

If a whole output valve glows red (other than the heater), often accompanied by a hum through the speakers, switch off immediately, and refer to Icon Audio or a service engineer, as this could be valve failure.

A valve that is lit up is not a guarantee that it is working properly; conversely a valve that is not lit up will not be working.

### Valve Replacement (see also section 7)

Valve life will depend upon such things as hours of use and number of on/off cycles, the HT Delay Circuit if fitted will extend the life of the valve by not stressing the cathode when it is cold. It is not good practice to remove the valves unnecessarily as this can strain the pins and cause tiny air leaks.

**Service:** Should you suspect a problem, you could return the unit to Icon Audio for a periodic service or return the valves for testing free of charge. You should carefully remove the valves (the KT88s should be held by the base when removing, to prevent damage) numbering them with a marker from left to right as you do so in order that that may be replaced in the same position. They should be well packed in cardboard & foam or similar, and returned to Icon Audio for testing. (Valves are very rugged if packed properly).

### Mains Supply

This amplifier is hard wired to work on 230/240v ac. The transformer may be re-configured for 110/120v ac by a qualified engineer. Contact for more information.

## 6 Specification & Features

(Typical conditions @ 240v 50Hz)

- KT88 output valves or eqv (6550)
- 6SN7 double triodes for first stage
- 274B (GZ34/5AR4) Full wave rectifier
- Hand wired point to point components
- No printed circuit board
- No tag board
- Ceramic valve bases for low noise/leakage
- HT delay circuit to protect cathodes (optional)
- 19.5w RMS per channel Ultralinear (at clipping)
- Signal to noise level -90db
- Freq response 20-20kHz +or- 1db
- Power bandwidth 10Hz-30kHz
- 0.2% THD @ 1w 0.5% @8w
- 4 and 8 ohms output taps
- Japanese EI transformers
- Choke regulated power supply
- Supplied with attractive safety guard
- Minimal feedback used
- 3 section transformer cover to reduce noise
- High quality metal film & wire wound resistors
- High quality polypropylene audio caps
- Japanese 'Blue' ALPS volume pot.
- Rubicon/Nichichron power caps.
- Internal wiring using silver gilt cable
- Valves carefully matched for best performance
- Gold plated Input & speaker terminals
- Inputs for CD, Tape, Tuner, Aux
- 350 mv sensitivity for full output (integrated)
- 1000mv (1v) sensitivity for full output (power amp)
- 230/240volts, 135watts
- 1.6 amp rear fuse (with spare)
- Size: W=40cm,D=32cm,H=25cm/Weight:17Kg
- IEC mains lead, (5amp fused)
- CE certified

Specification subject to change without notice.



## 7. Bias Adjustment

**Read notes all the way through before commencing. If you are unsure about any aspect contact your retailer, Icon Audio or a competent service engineer.**

The Stereo 20SE uses the 'Fixed bias' method of valve operation. This has the advantage of higher power, and cooler running. However occasionally (once or twice a year) it is advisable to check the bias reading using the supplied meter to ensure best performance from the amplifier. This is a safe procedure which involves measuring 900mv DC (or 0.9v) in the 2 sockets next to each KT88 and adjusting if necessary.

1, Tools you will need: The supplied meter or one set to measure approx 2 volts and a small flat blade screwdriver. Adjustments are done at zero volume with speakers connected. Run the amp for at least 15mins (if it is working correctly).

2, Connect: the black probe to the chassis 'earth' by unscrewing the '0' speaker terminal and tightening the probe in the exposed hole. And the other in the test socket adjacent to the valve on test. Set the 'Icon' meter to 2000mv or the 'black mark'. See pics.



Making the 'earth' connection.

3, Checking: You should get a reading of 900mv if valve is conducting correctly. But bear in mind that your mains voltage fluctuations can affect your readings up to 10% (i.e. 810mV to 990mV). It is more important that both valves read the same, within about 10-15mv.



Showing a probe reading 1<sup>st</sup> output valve

4, Adjusting: If not 900mv, set this by using the bias adjuster adjacent, then check the other valve, (L to R

1&2). The bias adjustment pots from left to right are normally 'mirror image' in rotation, so some will be anti-clockwise and some clockwise. They are very sensitive so adjust very carefully; use tiny turns of the screw. If the reading appears a little unstable this is normally due to mains fluctuations.

5, If one or more valves are showing erratic readings or you cannot set the 900mv, then that valve is probably faulty or out of specification. If you are unable to set the reading high enough this means the emission of the valve is low.

## Replacing the KT88 Valves

**Important: Do not attempt to change the KT88 without reading these notes. Failure to do so could be both dangerous and damaging to the amplifier.**

**Health & safety: High voltages are present inside the amplifier and on exposed valve sockets when valves are removed, so take suitable care. It is not necessary to remove the bottom cover. Beware valves get hot in operation!**

5, Changing valves: You should if possible check the bias setting before you attempt to change the valve(s), in order to familiarise yourself with the procedure.

The safe way is to change and check one or two valves at a time. Remove the first old valve and fit the replacement. Switch on and measure bias, you should be setting the reading for each valve to about 900mv, Do not allow the reading to go above - 990mv. Don't worry how low the reading goes this will not cause damage. Continue in the same way and fit all two valves. Do final adjustment when the amplifier is fully warmed up.

If all is well there should be no more than a barely detectable hum from the speakers, and the amplifier should sound OK When tested.

6, If you cannot set up 900mv then the valve is probably faulty or is unsuitable.

If the valves are brand new, you will need to check again after approximately 10 & 100 hours, after that only occasionally or if you suspect a problem.

**7, To avoid damage to the amplifier and electric shock hazard you must use only valves marked KT88, 6SN7. Or that you know to be direct equivalents.** Use only valves which you know to be new or good condition and test the amplifier thoroughly before resuming normal use.

### 8, Replacing the small valves:

**6SN7 valves.** Neither of these requires any set up procedure. It's just 'plug and play' although care should be taken when removing and inserting.

Icon Audio are happy to check the valves/amp or your re-bias your amp free of charge.

## 8 Guarantee

Thank you for purchasing one of our amplifiers. We hope you will be pleased with it.

***Icon Audio guarantee this amplifier for 12 months from the date of purchase for parts and labour. Valves are consumables and therefore on a pro-rata basis. Please keep your receipt as proof of purchase.***

All units are individually tested for performance for at least six hours before despatch to you. In the unlikely event that you believe the unit is not functioning correctly, it may be helpful to contact us first as we may be able to assist you. Then we would request that you return the item to us for further action.

You are advised to inform us of any change of address in order that we may keep you up to date of any upgrades or improvements. Check our website.

### **Exclusions**

Claims for any damage to either amplifiers or valves must be reported within three days of receipt.

This amplifier is designed for normal domestic hi fi use. It is not guaranteed for commercial, Public Address use, or use in other situations. The

guarantee becomes void if the unit has been modified in any way not approved by Icon Audio.

## 9 Packing Instructions

It is essential that the original box and packing be kept in good condition, as this provides vital protection during transit. Please do not write on box, but use removable labels. Should the original box and packaging be lost or become unusable a repacking charge of one hundred pounds will be made.

- Re-use the supplied plastic bag to keep the amp clean and free from damp.
- The mains lead fits in a foam cut-out underneath the amplifier.
- **Insert the piece of cardboard between the transformer cover and the valve guard; this will prevent the valve guard scratching the transformer paintwork.**
- Valves should be removed, numbered and packed in "bubble wrap" or similar for protection inside the valve cover.
- If the amplifier is stored in the box, keep upright.

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