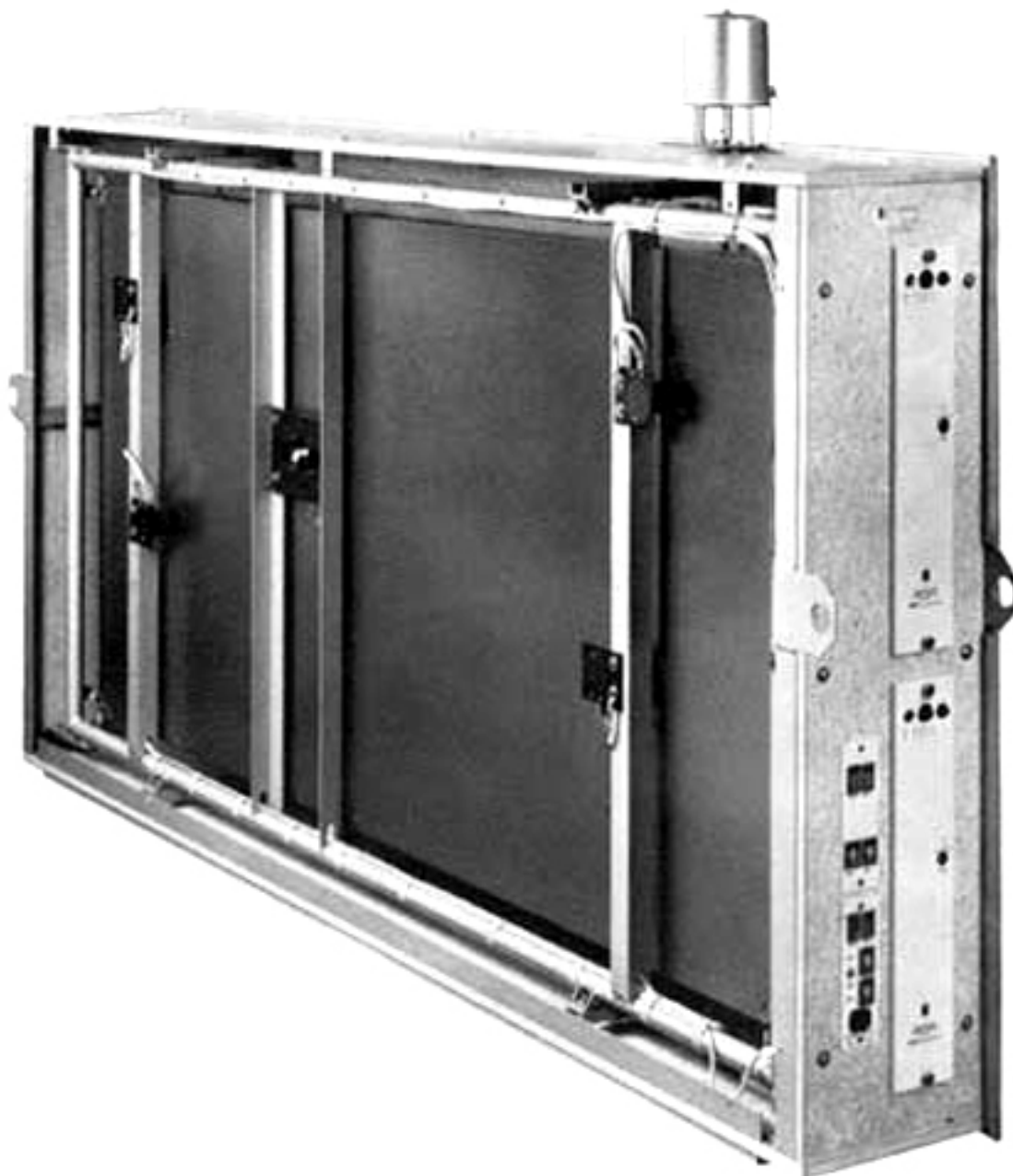


Nachhallplatte EMT 140



Harvey Radio Co., Inc.
103 West 43rd St.
New York 36, N. Y.

MODEL EMT 140 REVERBERATION UNIT
(Radio Standard Design 054)

TECHNICAL MANUAL

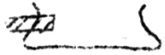
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- 9) Folder, EMT 140

ELECTRONIC APPLICATIONS, INC.
194 Richmond Hill Ave.
Stamford, Conn.
Tel: DAVIS 5-1574-5

SETTING UP THE EMT 140 ECHO UNIT

- 1) Uncrate carefully, leave unit standing as shown in the data sheet.
- 2) Remove both side walls and the top after removing the screws.
- 3) Note and check carefully that the steel plate is hanging on the wire clips at all points. Move the damping plate away from the metal plate - this can be done after removing the retaining cord which holds the damping plate bracket in a closed position.
- 4) Loosen the captive (second) nuts on the suspension bolt assembly, at all 8 points, to enable "take up" of the bolts.
- 5) "Take up" all eight bolts, one after the other, a little at a time at alternate sides and top and bottom, so that a uniform mounting suspension is obtained. Tighten the nuts on the bolts until the plate hangs evenly and under some tension. A measure of the proper tension is shown when the backbones of the steel wire hangers are about straight, thus:

plate 
backbone

not thus:



Do not tighten up too much as the steel wire hanger may pop out, and then you will have to put it in a new steel hanger, etc.etc.

The proper tension can be checked approximately by snapping the finger nail across the hanger, and if you get a pretty "tight" tone, all is well.

- 6) After plate is suspended as above, tighten up the captive nuts again - (by hand will do in most cases).

- 7) Now you are ready to mount and fasten the permanent magnet driver at mid-plate. Loosen the four nuts on the black bracket on which the driver is mounted - (also remove the four screws which mount the magnet to the bracket.)

Move the black bracket so that the voice coil is approximately centered. Then, use the plastic round template to closely center the voice coil. (The template slips over the voice coil and will be centered between the lugs which act as the boundary of the driver magnet).

When you feel that the voice coil is pretty closely centered, tighten the four bracket nuts. Then remove the plastic template, and mount the driver magnet in place, using the four cap head screws for this purpose.

- 8) The next operation is to resolder the copper pigtail strap (ground lead) inside the crystal pickup housing. You get at this by loosening the one screw which enables you to move cover over the housing. You will then see inside that the copper pigtail is loose, and it must be soldered to the left lug which connects with the shield of the co-ax cable. Solder this into place carefully and at the same time, check on the connection which comes from the crystal pickup center, through a spiral coil of copper, and connects to the other lug on the right, which eventually makes up the "hot" lead from the crystal pickup (co-ax center wire). Thereafter, after making certain that the co-ax connections to the pickup are separated (not shorting), you may close the round flap over the housing and tighten the cover screw again.
- 9) Now you are ready to mount and plug in the amplifier unit in the front. The amplifier shield and cover plate is removed by unscrewing the four knurled bolts.

Then remove the four mounting screws from the panel (top and bottom edge of the cut-out). Insert the amplifier so that the switch and pilot light are towards the top edge. Fasten the amplifier in place with the four mounting screws.

Thereafter, unpack the Siemens connectors inside and plug in the upper connector female to the top plug on the amplifier, and then the lower Siemens connector is to be plugged into the lower amplifier plug. DO NOT FORCE these plugs. They go in easily and are properly aligned when the metal strip which makes up the plug "handles" are facing away from the amplifier.

Then, plug in the co-ax plug in the lower right hand socket in the amplifier (seen from the rear); push the co-ax plug in firmly until it bottoms.

- 10) Now, plug in the 5-prong "Tuchel" plug into the front panel in the socket which accommodates this plug. There should be two audio cables connected to this Tuchel plug. One of these cables has a knot in it. This should be the "input", and you should check to see that the input is connected to pins # 4, #5, and to #3 ground (3wires). The output leads at the plug are to be checked against their connection to pins #1, #2, and #3 (ground). Correct connections are important, for if input and output are reversed, the unit will be prone to feedback, and give mediocre results.

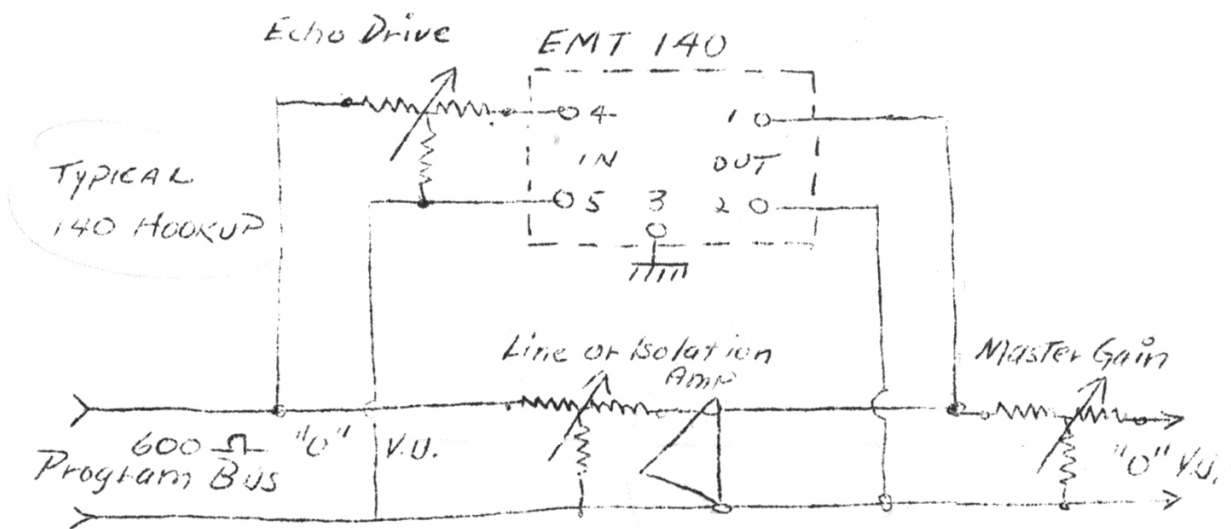
Now plug in the power plug (flat-iron type) and apply 110 Volts 60 cycles to the unit. Operate switch on the amplifier chassis, and see if pilot lamp glows. Turn off unit.

- 11) Attach now the hand wheel, which is keyed to a slot for the retaining screw on the knob shaft. Tighten temporarily; turn hand wheel, and see that motion is smooth from a position "0.8" (closed) to "5.5" seconds (open). The damping plate assembly operates like an acoustic absorber, i.e., closer to the plate, less reverberation, further away, more reverberation.

Carefully note the spacing between the steel plate, and the damping plate at "closed" damper position. There must be clearance of about 1/8 of an inch when the damper is closed. The damping plate must not touch the main steel plate when turned to the closest position. You can make some adjustment of this minimum, non-touching spacing, by loosening the four nuts on the top main frame assembly which support the damping mechanism brackets. Thereafter, carefully adjust the minimum, non-touching spacing to about 1/8"; then tighten the nuts again.

- 12) Test the entire unit at this time, prior to putting the sides and top panels back in place.

Feed program into the unit at about -8 V.U. and re-insert the echo output in your studio chain at about -10 V.U. Do not overdrive this unit.



Average echo time of normal echo chambers in use is about three seconds. Proper mixing of sound to and from the echo unit should produce good reverberation.

- 13) After it is determined that the unit is working all right, replace the sides and top. To do this, you must again remove the hand wheel.
 - a. Place the top panel in place.
 - b. Attach the hand wheel, making certain that the fixing screw is tightened at the extreme lowest end of the slot. This insures that the hand wheel will allow clearance of the top plate after the side panels are in place (which force the top plate up).
 - c. Attach both side units.
 - d. Test the unit carefully and let us know how you like its performance.

ELECTRONIC APPLICATIONS, INC.
194 Richmond Hill Ave.
Stamford, Conn.

Tel: DAVIS 5-1574-5

April 21st, 1958

ADDENDA TO SET-UP INSTRUCTIONS

- 1) A complete EMT 140 consists of the large case containing the suspension system and the steel plate, plus:

- 1 Amplifier
- 1 Driver Coil Magnet
- 1 Plexiglass Adjust Template for Magnet
- 1 Hand-Wheel for adjusting reverberation time
- 1 Tuchel 5 prong Connector (in some units, this is not delivered because XL-13 chassis connectors are provided)
- 1 Mains Plug
- 1 Set reserve springs for suspension system.

- 2) Para. 10 on page 4 should read:

XL Connectors are provided for input (male) and output (female) with XL connectors, #1 is ground, #2 is high, and #3 is low.

Operating Instructions EMT-140

TO BE READ BEFORE THE EMT-140 UNIT IS DELIVERED

(Also read the chapter on "Connecting the EMT-140 Into your Circuits on Page 6.

- 1) The unit, when packed, measures approximately 8 1/2 ft. x 4 1/2 ft. x 2 feet, and weighs approximately 670 pounds. It is usually delivered by truck and the trucking firm is obliged to deliver it to the sidewalk only. Such arrangements as must be made to move it inside, perhaps rig it on the outside of the building, and unpacking it, must be made by the user. It is best to uncrate the unit at the unloading spot and to move it inside in its unpacked condition in which case it only weighs about 370 pounds. Make sure that the unit never is tipped over on its side. It may be stood on end temporarily for purposes of moving it as long as the plate itself always remains in a vertical plane.

Select a fairly quiet spot for the unit where it will not be exposed to extremes of cold or heat. In locations where building rumble may interfere with operation, we recommend the use of our SM-100 Isolation mounts which will eliminate such interference as subway rumble, truck or auto traffic, heel clicks, air conditioning machinery rumble etc. A set of four of the SM-100 Isolation mounts is available from GOTHAM at \$ 27.00 per set. If the unit is to be placed alongside a wall, then make sure that the side of the unit which has the damping plate is next to the wall. Your unit is properly placed when the amplifier is at your right hand as you face the wall against which the unit is standing.

-1-

GOTHAM AUDIO CORPORATION

2 WEST 46 STREET, NEW YORK 36, N.Y. ··· COLUMBUS 5-4111



REVERBERATION UNIT EMT 140
(German Broadcasting Standard 054)

OPERATION INSTRUCTIONS

1. Insertion of the unit into the transmission channel.

Program input level source should be between 0 VU and 6 VU. The input impedance is in the order of 1000 ohms; an amplifier which has a low output impedance will therefore not be loaded when used as source. The output internal impedance amounts to about 25 ohms while driving 600 ohms circuits. It will, therefore, not be induly loaded by the standard broadcasting attenuators (e.g. W 66, with 1000 ohms input impedance). The unit is adjusted to an input and output level of 0 VU - 6 VU at the factory, assuming 600 ohms impedance.

For the addition of reverberated sound to the program channel, two separate attenuators are needed, one of which will be inserted into the straight channel - the other one controls the reverberated signal. Practical experience shows that the reverberated signal should have a level about 6 DB below program. It is advisable to insert a separate attenuator at the input of the unit. (See diagram XEMT 140-10).

2. Operation.

Switch on main switch at the amplifier section of the unit. Red indicator lamps light up.

The adjustment of the desired reverberation time is controlled by the handwheel. The scale is calibrated in seconds of reverberation time at 500 cycles. The reverberation time can be varied from .8 seconds to 5 seconds continuously.

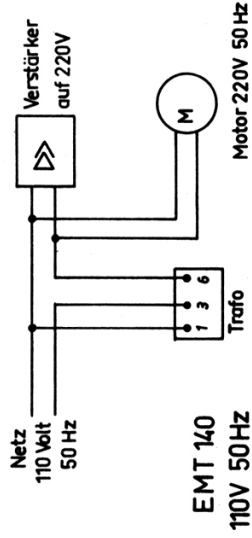
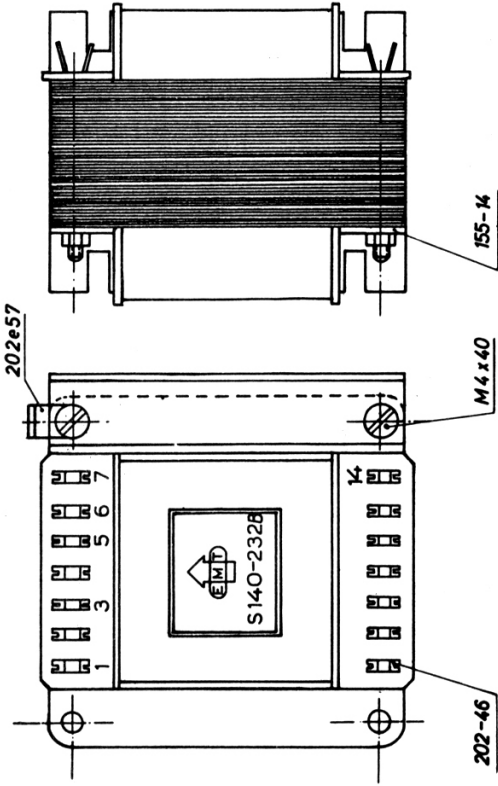
The frequency response of the reverberation time is nearly flat for small values as it corresponds to small studios for speech recording. For longer reverberation values it drops to about 1.5 sec. at 10 kc. Long reverberation times, however, are accompanied by rise in low frequencies. This corresponds to the behaviour of large reverberant rooms. (For exact curves see sheet XEMT 140-7).

For the remote control of the unit from the studio, a remote control unit is available.

It is impossible to make the level adjustment with sinusoidal signal because of the various resonant frequencies of the reverberation plate which would considerably change the level for very minute changes in frequency. If warble tones are used in a level measurement, use a sweep of ± 25 cycles at a warble rate of 4 to 10 cycles - assuming tests at various parts of the audio spectrum. However, whatever output indicator is used should have a long time constant; thus, level recorder should be adjusted to long RC by supplementary "C" elements. In any case, set the reverberation time for 2 seconds.

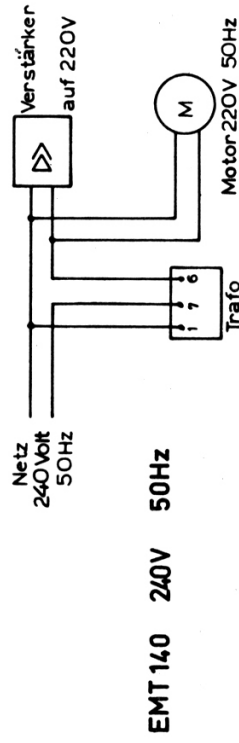
Finally check the hum level at the output of the unit. This adjustment is to be made with no input signal. Put the front plate back on the amplifier. After this has been done, the miniature hum potentiometer "Entbr." #5 can be adjusted through the hole in the front plate by means of a screw driver. Check the proper load of the voice coil at the upper terminal board #3 and #4 for a value of 12.5 ohms at 1000 cycles. The contact pickup microphone can be checked with a capacity meter at the end of the coaxial cable. The capacity should amount to about 1000-1300 MMFD with high Q at 1000 cps.

The unit adjusted according to the preceding procedure is ready for use.

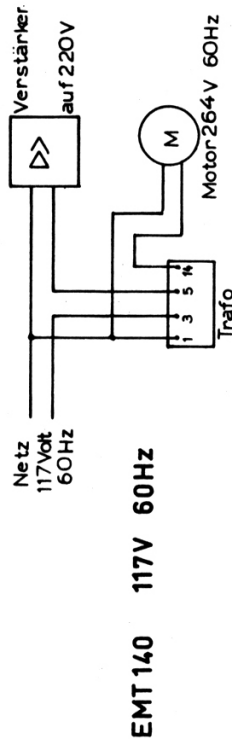


EMT 140
110V 50Hz


Netz	50 Hz	60 Hz	Wicklung
1	0 Volt	0 Volt	670 W 0,5 ^l CuL
3	110 Volt	117 Volt	610 W 0,35 ^l CuL
5	220 Volt	220 Volt	90 W 0,35 ^l CuL
6	240 Volt		120 W 0,35 ^l CuL
7			
14		264-V	50 W 0,35 ^l CuL



EMT 140 240V 50Hz



EMT 140 117V 60Hz

 Elektro Messtechnik W. Franz K. G., Lehr (Schwarzweid)	Ersatz für S140-232A v. 12.8.51 (deutsch) Ersatz durch Zehege Nr. S 140-232B
	Netztransformatoren für 110, 220, 240 Volt 50 Hz für 117, 220, 264 Volt 60 Hz

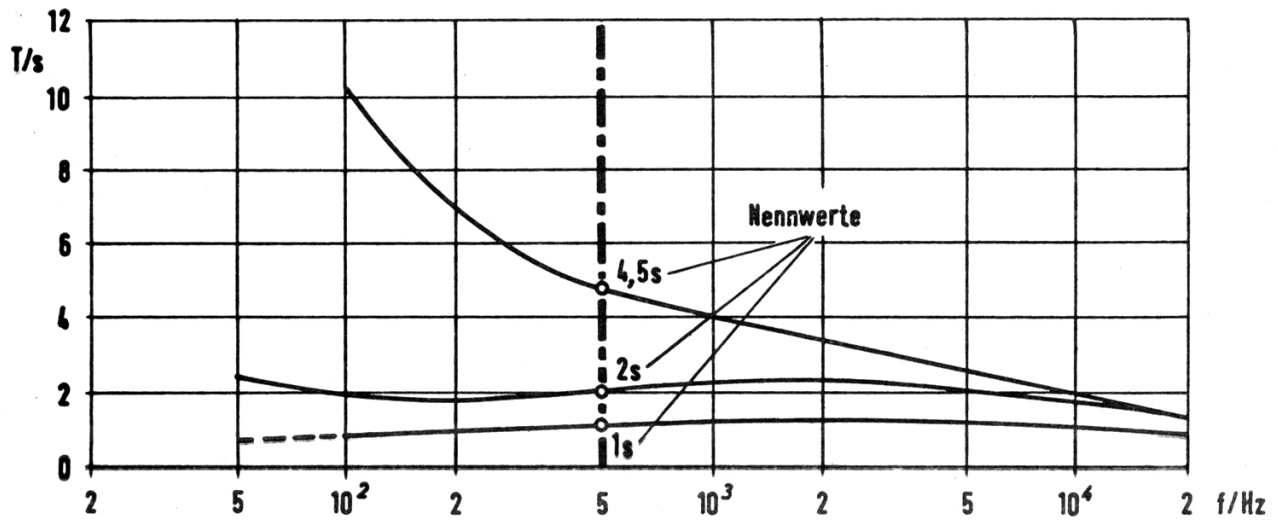


Abb.1 Frequenzabhängigkeit der Nachhallzeit (Nennwerte gelten für $f = 500 \text{ Hz}$)
 Frequency response of reverberation time (Nominal value is given at 500 cps)

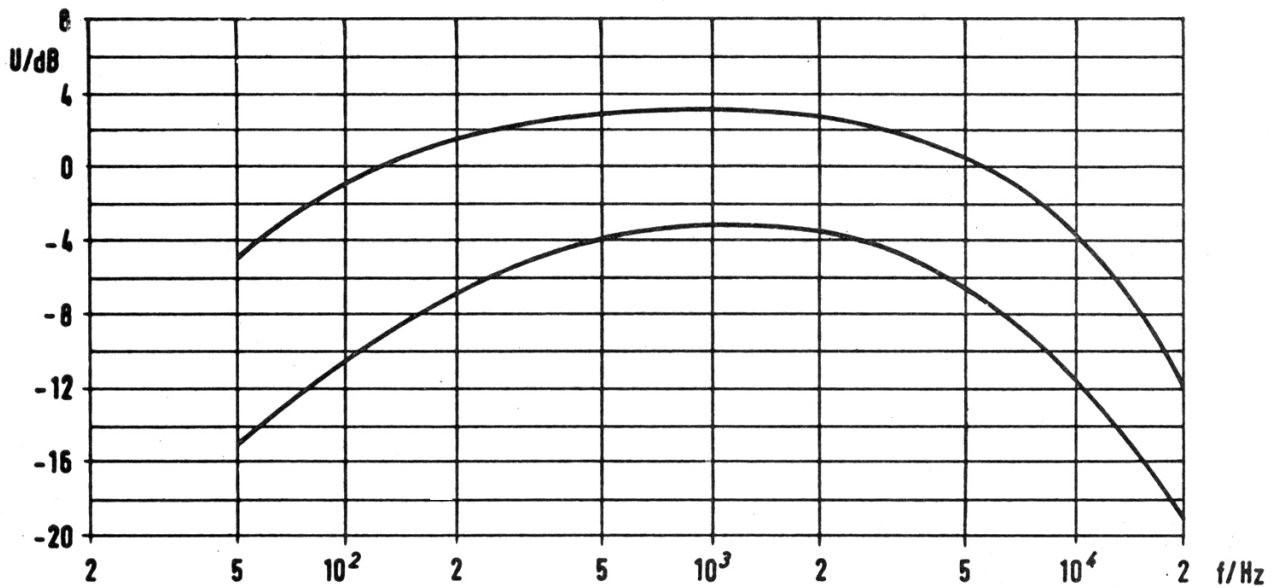


Abb.2 Toleranzbereich des Frequenzganges der gesamten Nachhalleinrichtung $U_A = f(f)$ bei $U_E = \text{const.}$, $T = 2\text{s}$
 Tolerance range of frequency response (total) for reverberation unit $U_{\text{output}} = f(f)$ at $U_{\text{input}} = \text{const.}$, $T = 2\text{s}$

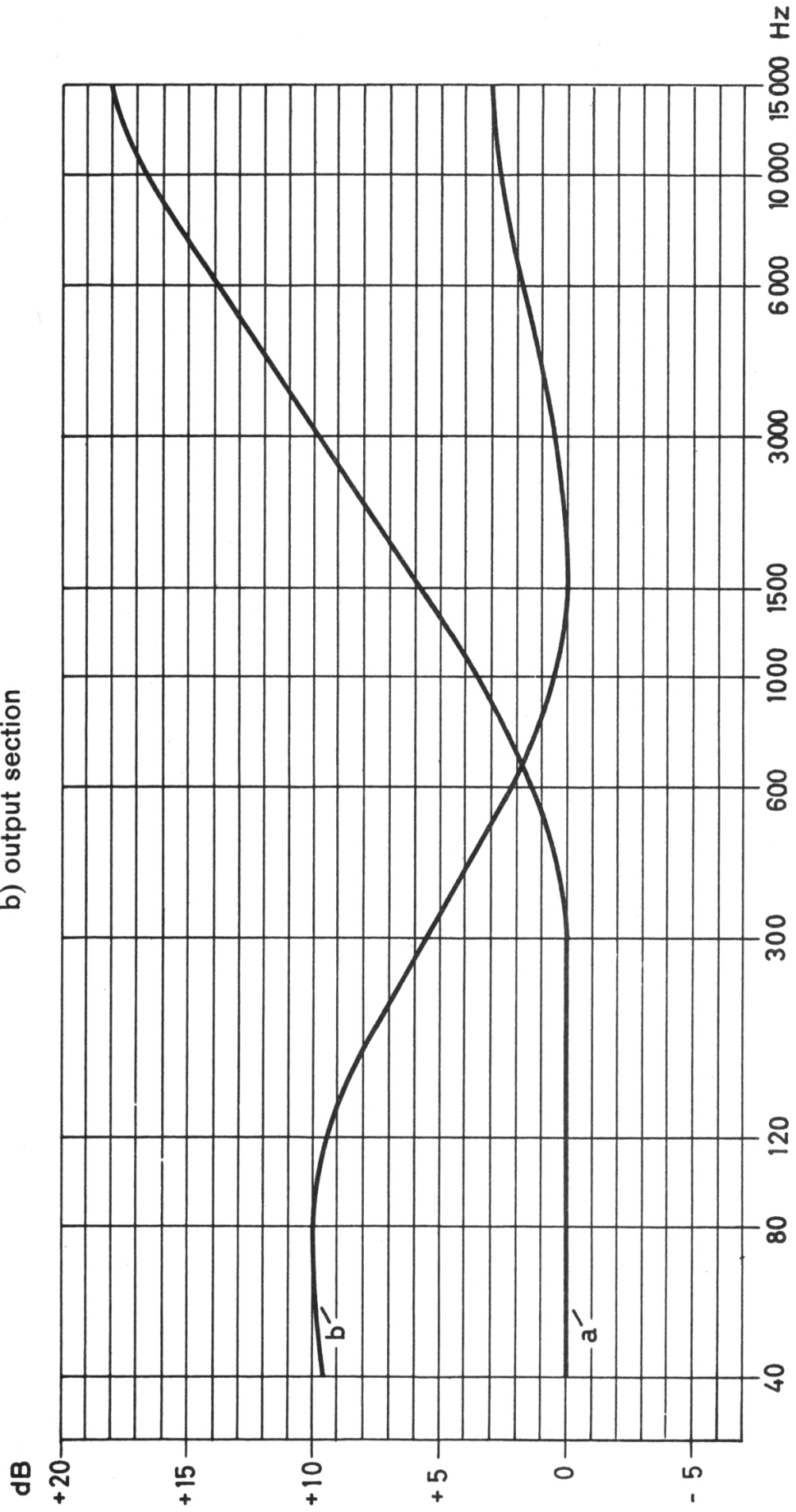


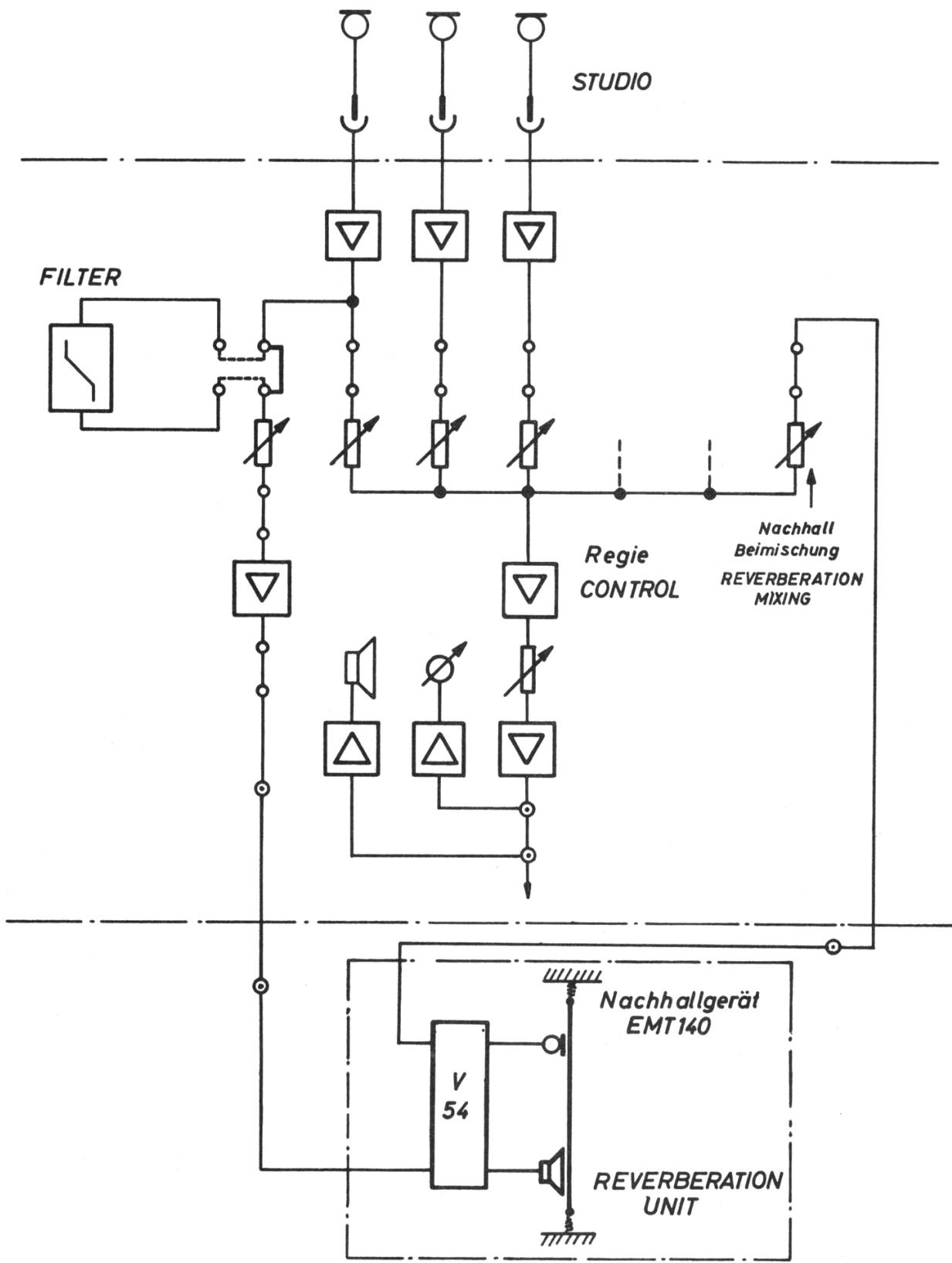
gezeichnet	Datum	Name	Werkstoff		
geprüft	25.3.66	fs	Halbzeug	off.	Ersatz für Original X 140 - 7/6A vom 7.3.63
Normgepr.			Modell	Maße	Ersetzt durch
Maßstab			Nachhallzeit Übertragungsmaß Reverberation Time Frequency Response		Zehngs Nr. X 140 - 7 X 140 - 6A

Equalization characteristics

a) driver section

b) output section



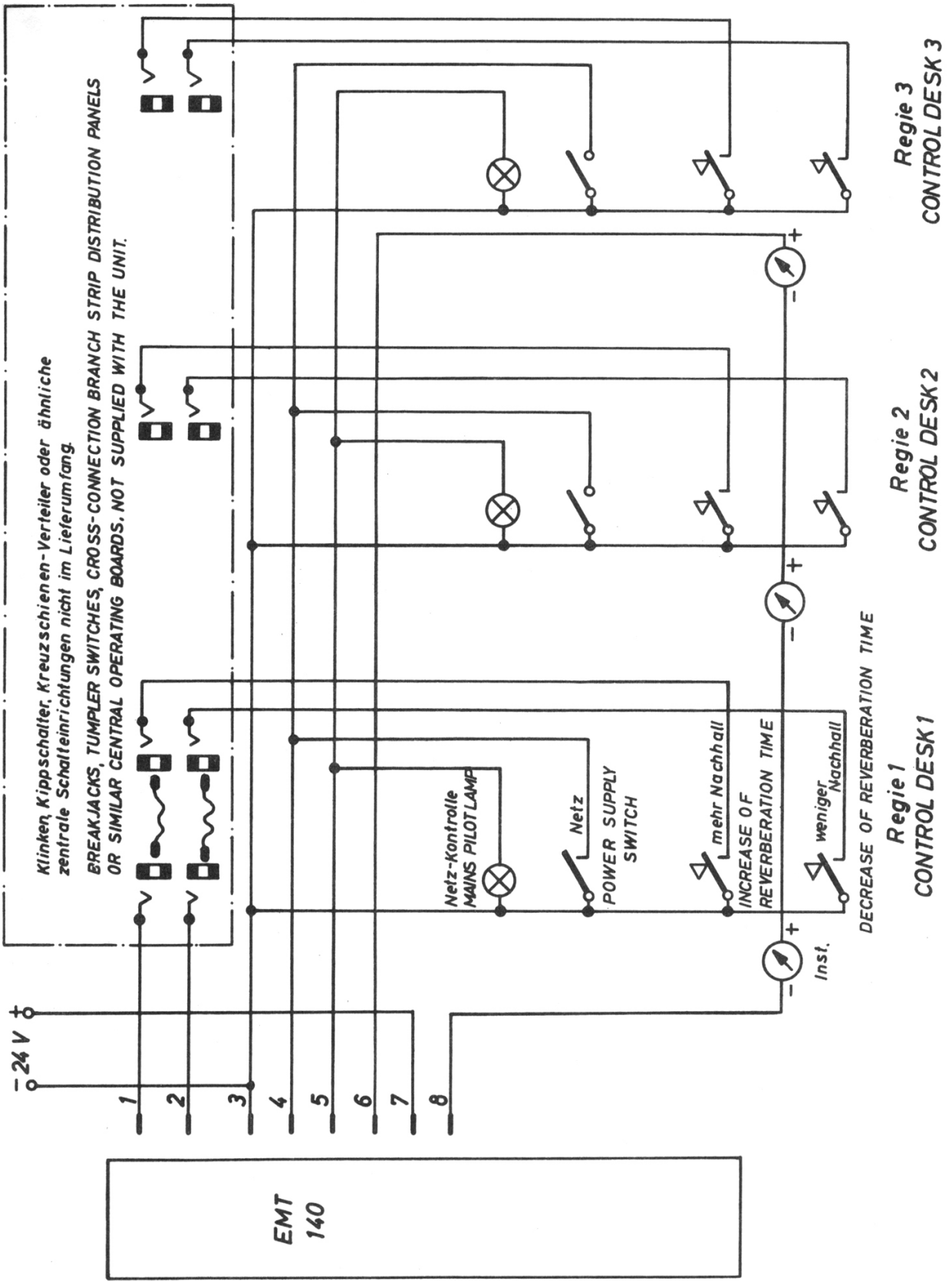



**Elektro
Messtechnik**
 W. Franz K.G., Lahr
(Schwarzwald)

Ersatz für _____
 Ersetzt durch _____

Blockschema für Nachhallerzeugung
CONNECTION DIAGRAM FOR REVERBERATION GENERATION

Zchnngs
 Nr. X 140-10





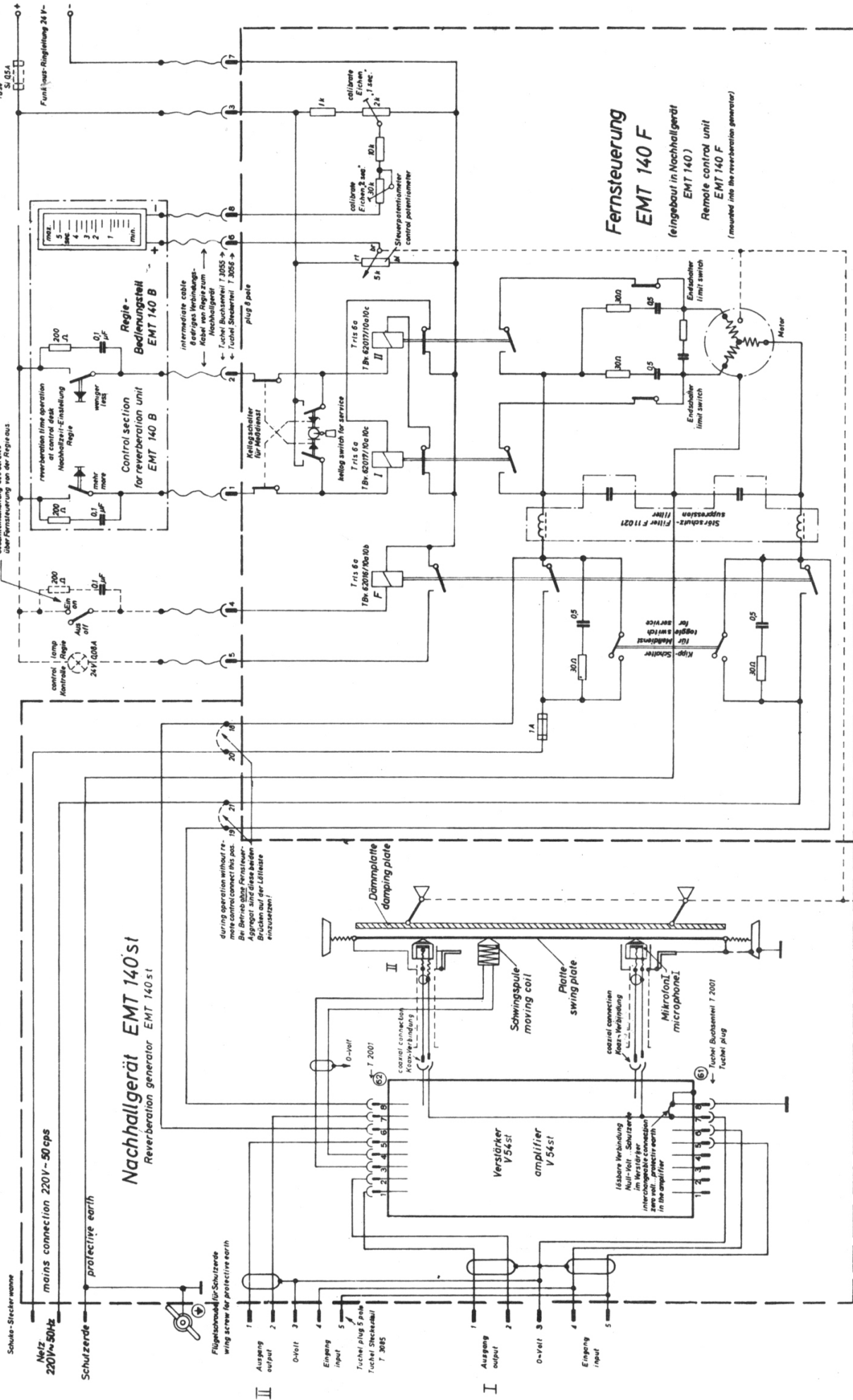
**Elektro
Messtechnik
W. Franz K. G., Lahr**
(Schwarzwald)

Ersatz für _____
Ersetzt durch _____

Zchnng
Nr. **X140-20**

Schaltung mehrerer Regie-Bedienungsteile
CIRCUIT DIAGRAM FOR MULTIPLE CONTROL DESK ARRANGEMENTS

Netz } 110V 50Hz c/s { siehe Prüfschaltung EMT 140 st Blatt 2
 mains } 117V 60Hz c/s { cf. diagram EMT 140 st sheet 2



Schule-Steckerwanne

Netz 220V/50Hz

Schulzterde

Nachhallgerät EMT 140st
 Reverberation generator EMT 140st

Flügelsschraub für Schutzterde
 wing screw for protective earth

Ausgang output

0-Volt

Eingang input

Tuchel-Stecker 5 Pin
 Tuchel-Stecker T 2001

Ausgang output

0-Volt

Eingang input

Ausgang output

0-Volt

Eingang input

Ausgang output

0-Volt

Eingang input

Ausgang output

0-Volt

Eingang input

Ausgang output

0-Volt

Eingang input

Ausgang output

0-Volt

Eingang input

Ausgang output

0-Volt

Eingang input

Manöver zur Nachhallzeit-Einstellung
 (enthält die Fernsteuerung)
 manual operation for reverberation time

Rundfunkbezeichnung O 54 Broadcast designation O 54

Fernsteuerung EMT 140 F
 (eingebaut in Nachhallgerät EMT 140)
 Remote control unit EMT 140 F
 (mounted into the reverberation generator)

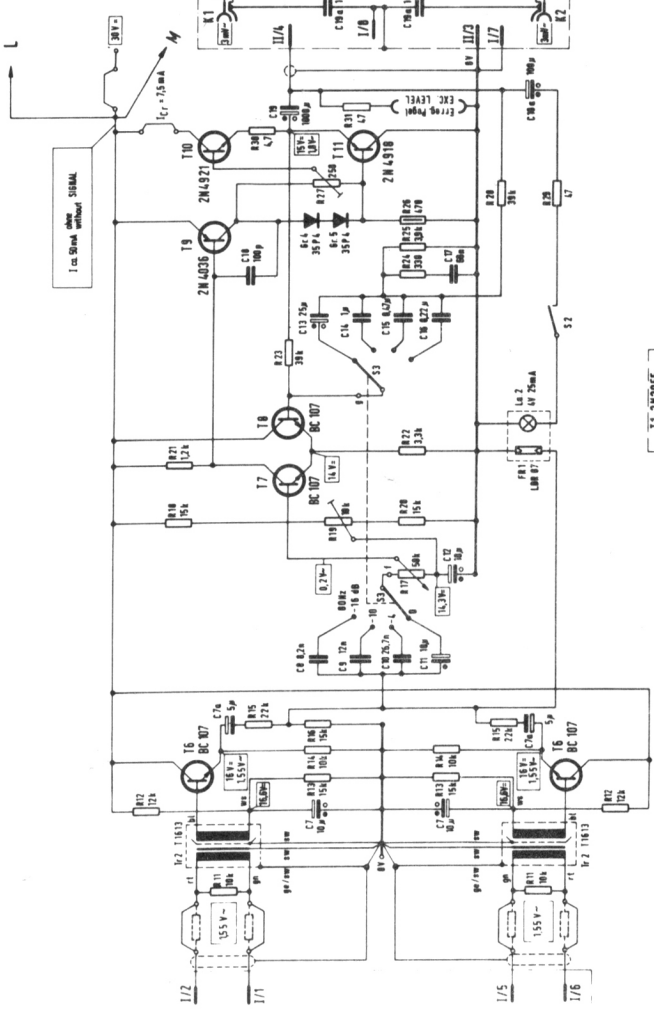
Prüfschaltung EMT 140 st Bl. 1
 Test connection diagram sheet 1

Nachhallgerät EMT 140st
 Reverberation generator EMT 140st

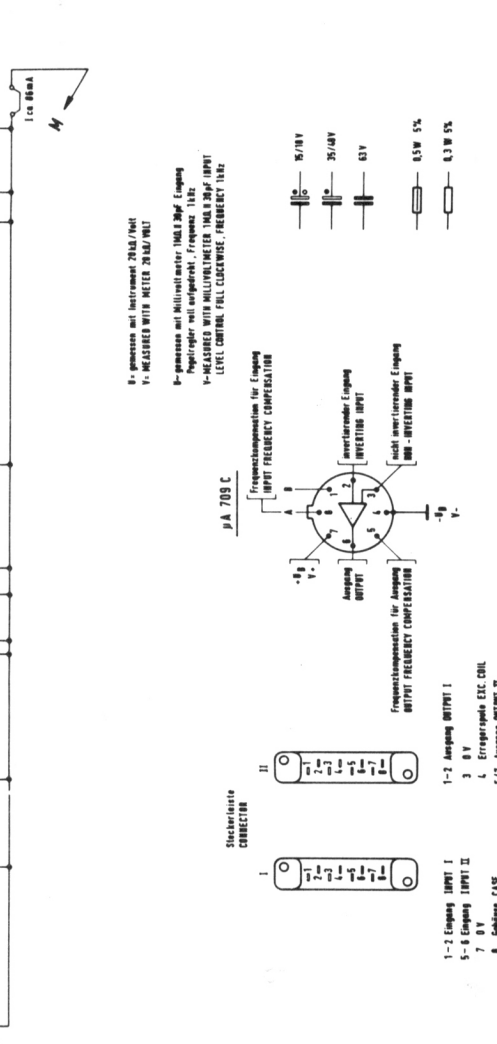
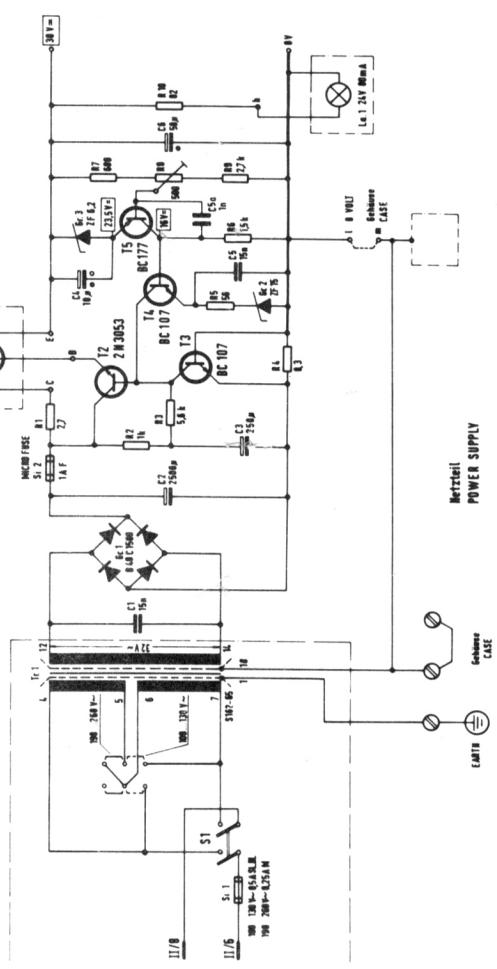
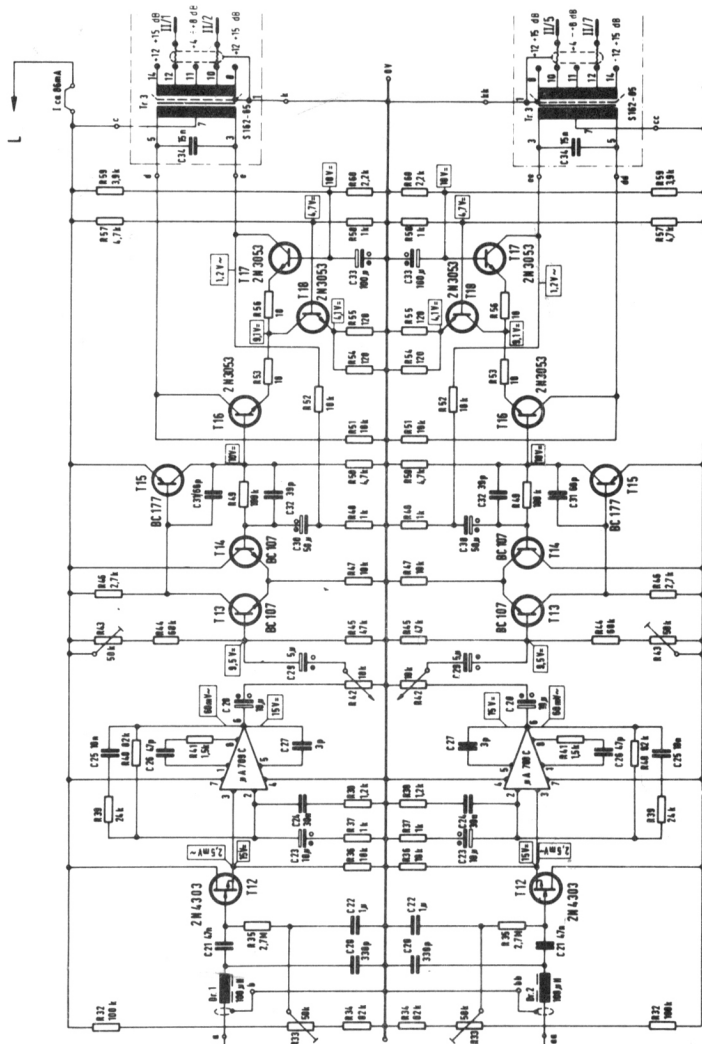
ELEKTROMESSTECHNIK
 WILHELM FRANZ KG LAHR/SCHWARZWALD

Gültig ab Fabrikationsnummer 1001
 Applies to serial numbers beginning with Nr. 1001

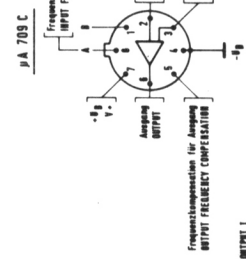
Erreger - Verstärker
EXCITATION AMPL.



Wiedergabe - Verstärker
PLAY BACK AMPL.



R - gemessen mit Instrument 20kΩ/10kΩ
 V - MEASURED WITH METER 20kΩ/10kΩ
 R - gemessen mit Millivoltmeter 10kΩ 20kΩ Empfindung
 V - MEASURED WITH MILLIVOLTMETER 10kΩ 20kΩ INPUT
 LEVEL CONTROL FULL CLOCKWISE, FREQUENCY 1kHz



- Steckverdrahtung CONNECTION
- 1 0
 - 2 1
 - 3 2
 - 4 3
 - 5 4
 - 6 5
 - 7 6
 - 8 7
- 1-2 Ausgang INPUT I
3 0V
4 Erregungs EXC. CUL
5/7 Ausgang OUTPUT II
6/8 Netz-MAINS

- 1-2 Ausgang INPUT I
3 0V
4 Erregungs EXC. CUL
5/7 Ausgang OUTPUT II
6/8 Netz-MAINS

Technische Änderungen vorbehalten
SUBJECT TO ALTERATIONS