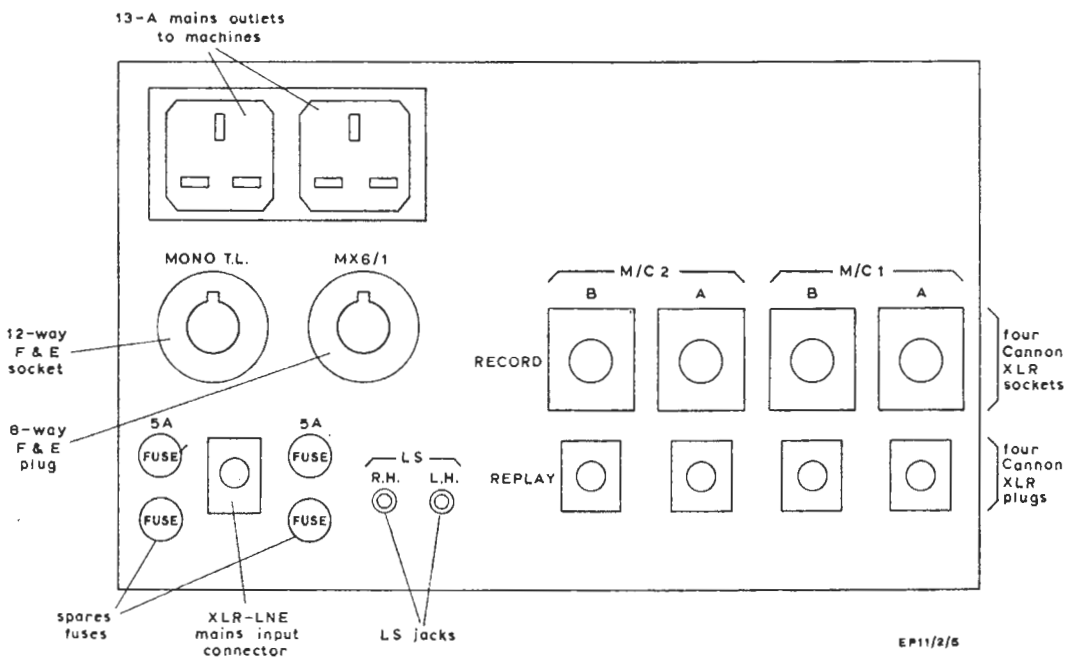

Fig. 1. Rear of EP11/2, showing Connections

Introduction

The EP11/2 is a mains-powered unit designed for use on radio outside broadcasts in conjunction with Studer A62 magnetic tape machines. For operation, it is mounted between two A62 machines and connected to both, providing monitoring and linking facilities. It may be used either free-standing or locked into a specially equipped bench top when mounted in a vehicle.

The unit is about 12½ inches wide, 12½ inches high and 16½ inches deep, and it weighs 50 lb. It is supplied with a cover fitted with a recess to accommodate all connectors. The unit incorporates three amplifiers AM9/5, one amplifier ME12/5 and a power supplier PS2/9 or PS2/49.

Facilities

The P.P.M. and loudspeaker monitoring facilities provided are switchable to the input or output of either tape machine. A *Stereo/Mono* key conditions the unit to stereo or mono programmes. The P.P.M. controls include keys which permit selection of the *A*, *B*, $(A + B)$ or $(A - B)$ signal in the stereo mode. Control of loudspeaker volume is by a three-position key.

A jackfield allows connections to be made to the record inputs and replay outputs of either mono or stereo machines. In the latter case, this permits either mono or stereo recordings. Mono connections only may alternatively be made via a 12-way F. & E. socket on the rear of the unit. The jackfield also provides L.S. listen, P.P.M. input, parallel and termination facilities, it gives access to various tie-lines, and includes an MX6/1 output monitor jack for use when the EP11/2 is operated in conjunction with an MX6/1 O.B. mixer unit

A power supplier PS2/9 or PS2/49 provides 24 volts d.c. for the amplifiers. The same power supplier also operates the MX6/1, where required, the feed being taken via an 8-way F. & E. plug on the rear of the EP11/2 and connecting cable.

An inclined frontal control panel carries the P.P.M. instrument and all L.S. and P.P.M. monitoring control and selection keys. There is also a small amplifier-mounting panel to take three AM9/5 and one ME12/5 amplifiers and their preset gain controls

The rear of the unit carries all input and output connections to the machines and external units; mains connectors and fuses and two jacks for a pair of loudspeakers are also at the rear.

Seven short double-ended screened patchcords are supplied for use with each unit. These may be stored in the lid.

General Description

External Connections (Fig. 1)

When stereo tape machines are used, eight screened cables terminated in 3-pin Cannon XLR plugs and sockets are required to link the machines to the EP11/2. The record input plugs and replay output sockets on the machines are connected to the appropriate labelled sockets and plugs on the EP11/2 rear. When mono tape machines are used, the plugs and sockets corresponding to the *A* chain are connected via four screened cables.

Two domestic-type 13-amp flat-pin sockets on the rear of the unit provide a mains power source to drive each machine. Mains power is fed to the unit itself via a 3-pin XLR-LNE type fixed plug, and is fused (at 5 amps) before being distributed both internally and to the tape machines.

For stereo work, the record *A* and *B* zero-level inputs are plugged directly into the jackfield for each machine and the replay outputs are similarly obtained.

However for mono work different methods of connection are employed according to the type of machine in use as follows.

1. Mono Operation with Mono Machines
Record input and replay output connections are made as if in the stereo mode but using only the *A* leg jacks.

2. Mono Operation with Stereo Machines
Record input and replay output connections are made to the appropriate *Mono* jacks. This parallels the inputs and also the outputs of both tracks, thus providung virtually full-track recording.

If it is decided to use the F. & E. socket marked *Mono Tie Lines* at the EP11/2 rear, the record input connections are automatically made via innered wiring on the mono record and tie line jacks, but the replay output lines have to be plugged through on the jackfield by joining

(a) *M/C 1 Mono Rep* to *T.L. 3* and
(b) *M/C 2 Mono Rep* to *T.L. 4.*

Other external connections required are

(i) The *L.H.* and *R.H.* loudspeaker jacks on the EP11/2 rear have to be connected to their respective speakers, and

(ii) If the EP11/2 is being used in conjunction with an MX6/1, this mixer has to be connected to the MX6/1 plug on the EP11/2 rear. This connector carries 24 volts d.c. from the EP11/2 power supplier to the MX6/1 and extends the P.P.M. circuit to the mixer at the correct level, which is —20 dB for 0 dB line-up. The same connector makes the MX6/1 output available on the EP11/2 jackfield.

mode. This strapping is effected just prior to the AM9/5 loudspeaker preamplifiers.

On the right of the meter are a further five keys associated with P.P.M. monitoring. The top three perform a similar function to the first three loudspeaker keys, selecting *Ing. Prog.* or *Line Out* for one or other machine.

The two remaining P.P.M. keys are linked together and between them select the signal mode of the P.P.M., which may be *A*, *B*, (*A* + *B*) or

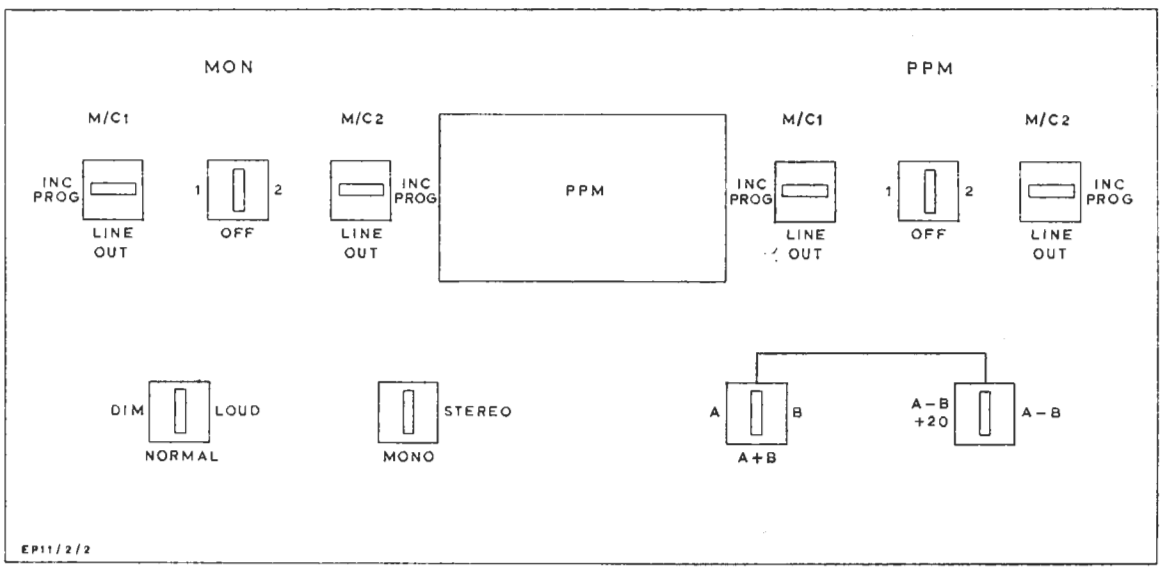

Fig. 2. EP11/2 Control Panel Layout

Control Panel (*Fig. 2*)

This inclined panel at the front end of the top of the unit carries the P.P.M. instrument and the monitoring control keys.

To the left of the meter are five loudspeaker monitoring control keys. The top key of this group selects the machine to be monitored. Further keys on either side, one for each machine, select *Inc. Prog.* or *Line Out*, i.e., record or replay monitoring; these keys switch the *A* and *B* legs of a stereo signal simultaneously. A fourth key controls the level on both loudspeakers and has *Dim*, *Normal* and *Loud* positions; *Dim* and *Loud* each give a level change of 10 dB relative to *Normal*. The fifth key, marked *Mono/Stereo*, has two functions; one concerns the P.P.M. monitoring circuit (see below) and the second is to strap together the two inputs to the speakers in the mono (*A* — *B*). The extreme positions of the right-hand one of these two keys select (*A* — *B*) or (*A* — *B*, +20 dB) to the meter. The latter setting is to assist in lining up the machines, when it is necessary to examine the (*A* — *B*) signal and adjust the machine to give a 'null' or minimum reading, e.g. during checking of the replay azimuth adjustment with a 10-kHz test-tape. Boosting the (*A* — *B*) signal by 20 dB makes the null easier to detect on the P.P.M. In the central position of this right-hand key, the P.P.M. mode control is transferred to the adjacent left-hand key, which can select *A*, *B*, or (*A* + *B*) signals.

As the (*A* + *B*) signal is some 3 dB higher in the mono mode than the average value in the stereo mode due to the coherence of the former, a 3-dB losspad is inserted in the (*A*+*B*) position in mono by the *Mono/Stereo* key.

Jackfield

This comprises four rows of seven jacks each. In addition to *A*, *B* and *Mono* record input and replay output jacks it carries right and left loudspeaker listen jacks, a 600-ohm termination jack and two three-jack parallels. The parallel jacks allow the same programme to be recorded on both machines if desired, by paralleling the *A* and *B* (or the *Mono*) inputs.

There are also high level (−10 dB) and low level (−55 dB) P.P.M. input jacks for use in lining up the meter and its amplifier. Many of the jacks on the field are breakjacks with innered connections; these are indicated by red lettering on the designation strip.

45 dB, adjustable ±1 dB by a similar preset control The ME12/5 is internally strapped to operate from an input of −10 dB.

The amplifier panel also carries a neon lamp which lights when the mains supply is on.

Power Supplies (*Fig.*)

The power supplier mounting space at the front of the unit to the right of the jackfield accommodates a PS2/9 or a PS2/49, either of which provides 24 volts d.c. for the amplifiers and for an MX6/1 if used. The a.c. mains and 24-volt d.c. circuits are both indicated in Fig. 4. The fuse shown in the neutral wire is as originally installed but will be bypassed when the equipment is con-

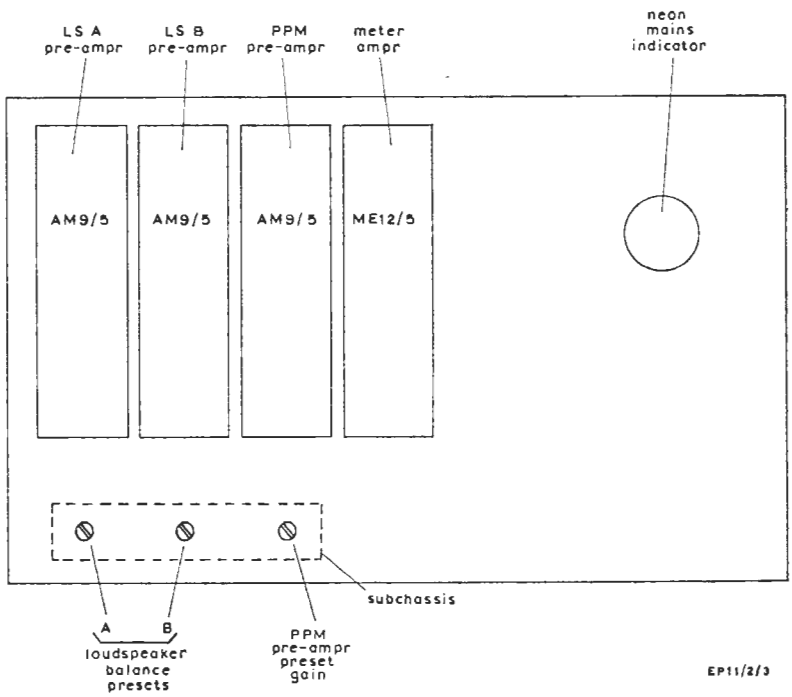

Fig. 3. EP11/2 Amplifier Panel Layout

Amplifier Panel (*Fig. 3*)

This panel carries the three amplifiers AM9/5 and the P.P.M. amplifier ME12/5 mounted on a subchassis. Two of the AM9/5s are the left and right loudspeaker preamplifiers; these have a gain of 50 dB, adjustable ±3 dB by a preset control accessible to a screwdriver via a hole in the front of each amplifier. The third AM9/5 is the P.P.M. preamplifier; this has a gain of

verted to single-pole fusing.

Mountings

The unit has four feet fitted with moulded rubber pads for ordinary free standing on a desk or bench. It may also be mounted on a specially prepared bench, as in the Debonair regional O.B. vehicles; in this event the four feet are lowered into the wider end of four egg-shaped holes and

the weight is taken by a flange on the upper part of each foot. The unit is then slid backwards to engage the narrow ends of the holes, and is held vertically in position by a smaller flange lower down on each foot; this flange is small enough to drop through the wide end of the hole but not to come out again at the narrower end. A vertical bolt on the front of the unit may be dropped into the bench to prevent the unit from sliding forward and releasing the feet.

Cover

When the cover is in position, the internal pocket must be at the front. If reversed, it fouls the top of the unit.

a loss of some 6 dB, which can be offset by raising the replay output level of the machines; there is sufficient gain in hand in an A62 to do this without risking distortion up to peak level or just above. Following the 285-ohm resistors. the outputs are fed directly to jacks.

In the mono mode, with a stereo machine, it is necessary to combine the two outputs, *A* and *B*, to provide a single output. The combination is effected by a hybrid coil LL/62 after the 285-ohm resistors. The arrangement results in a 6-dB extra gain for the combined mono signals, less a theoretical 3-dB loss in the hybrid coil and a further 1-dB loss due to limitations of its construction.

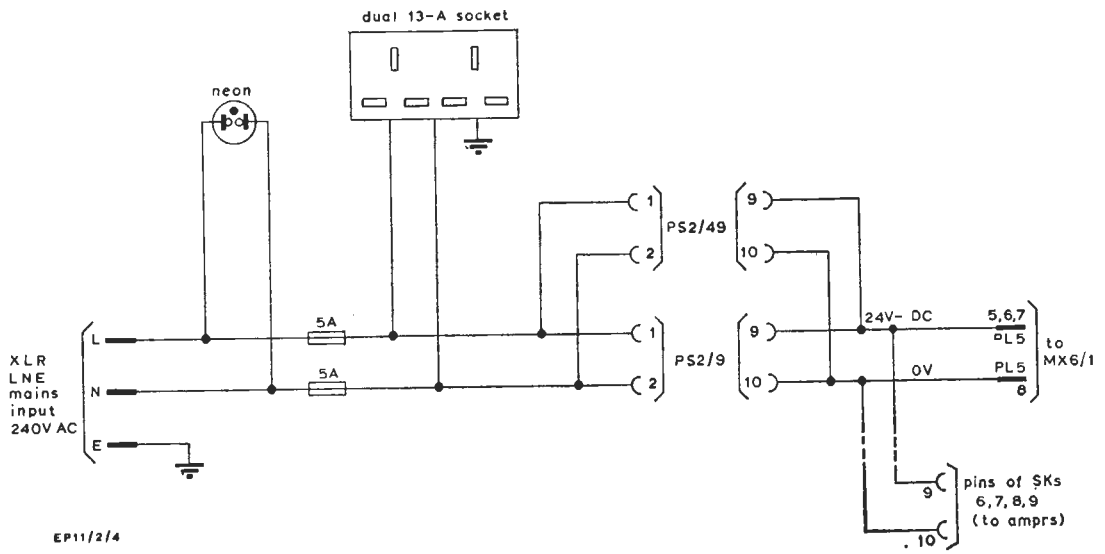

Fig. 4. EP11/2 Mains and 24-volt D.C. Circuits

Circuit Description (Fig. 5)

Record Programme Circuit

In all instances the record signal is fed directly into the Studer A62 machines, which effectively bridge the source because of their high-impedance inputs. When stereo machines are being used for mono recordings the two inputs, *A* and *B*, are fed in parallel.

Replay Programme Circuit

In the stereo mode, each replay output from the machine is taken via two 285-ohm resistors, to make the 30-ohm output impedance of the A62 appear as a 600-ohm source. This involves

A losspad after the hybrid coil removes the remaining unwanted 2 dB of gain, and the output then appears on a jack as a 600-ohm source. This jack has 600 ohms normalled across its inners, to load the hybrid coil correctly when no output is plugged up. Without this 600 ohms, crosstalk would be heard on replay monitoring during the recording process. It is therefore important to preserve a 600-ohm load when the normalled 600-ohm resistor is overplugged.

In the mono mode, with mono machines, the circuit is the same as for one leg of the circuit used for stereo recording.

P.P.M. Monitoring

The *A* and the *B* chains are kept entirely separate during the selection of machine and of replay or record condition, and are then combined both in and out of phase (via pads ensuring *A* and *B* separation) to provide $(A + B)$ and $(A - B)$ outputs. The $(A - B, +20$ dB) output is similarly obtained by combining out of phase via smaller loss pads. *A* and *B* can also be separately selected by one of the two $(A + B)/(A - B)$ keys. The output from these keys is fed via an input break jack to an AM9/5 amplifier to restore the level lost in the combining network. From the AM9/5, the signal is fed at -10 dB

(a) to the EP11/2 P.P.M. via an amplifier ME12/5, and

(b) via a 10-dB pad to the MX6/1 plug, where it appears at -20 dB, and hence to the P.P.M. on the MX6/1 if the latter is connected.

The EP11/2 meter should be lined up by injecting 1-kHz tone at -10 dB into the *P.P.M. −10 In* jack and setting the meter to read *4*.

In mono operation it is normal to leave the P.P.M. mode selection keys in the $(A+B)$ position. An additional 3-dB pad is switched into circuit in mono by the *Mono/Stereo* key to give compatible monitoring on mono and stereo, as explained earlier.

The P.P.M. instrument is of the 100-μA movement type normally used with an ME12/5 amplifier.

L.S. Monitoring

As with P.P.M. monitoring, the *A* and *B* L.S. monitor chains are kept separate on the machine input and output selection keys. The L.S. monitor chains remain separate throughout on stereo, but are combined before the preamplifiers on mono.

After initial selection, the two chains are routed via a *Dim/Normal/Loud* key. The *Dim* and *Loud* positions respectively add and remove 10 dB of attenuation relative to *Normal*. From this key, the signals are fed to the loudspeakers via the two AM9/5 preamplifiers. The ± 3 dB preset gain controls on the preamplifiers are provided to compensate for any out-of-balance in the loudspeakers; the preamplifier balance should be set with the *Mono/Stereo* switch in the *Mono* position, the preset controls being adjusted to obtain a central image.

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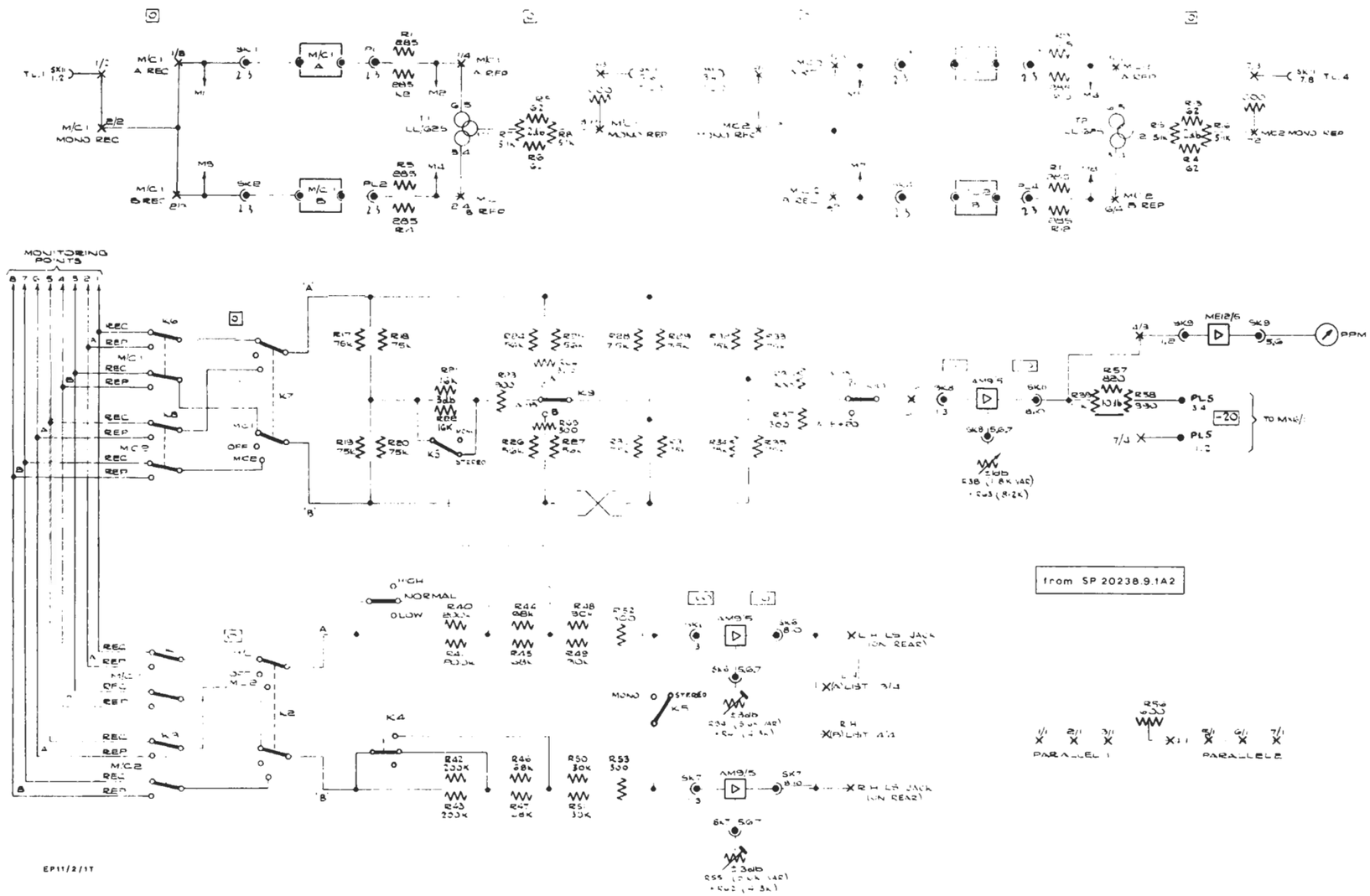

Fig. 5. EP11/2
Programme Circuit