TAPE LINKING CONSOLE DK1/3

Contents

Introduction

The DK1/3 is a tape recording channel console with facilities for mixing the outputs of up to three stereo reproducing machines giving both stereo and mono outputs. It also provides for recordings to be made on any or all of the machines from a common source or from tone. Comprehensive monitoring facilities are included and provision is made for both telephone and microphone/loudspeaker intercommunication.

The tape machines may be remotely controlled from the console, or from a studio via the console.

The codes of subunits incorporated in the desk are indicated in Fig.1.

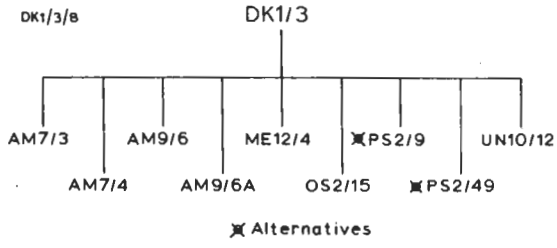

Fig. 1. DK1/3 Subunit Codes

AM7/3	AM9/6A	PS2/9
AM7/4	ME12/4	PS2/49
AM9/6	OS2/15	* UN10/12

* Instruction to be issued about mid 1972

Some DK1/3 consoles have been modified in various ways, details of which are given in this Instruction. Care should be taken before work is done on a particular console to check which, if any, modified facilities are fitted. Later models, coded DK1/4, incorporate all the modifications.

General Description

The console consists of a cabinet 4-ft 9-in high, 1-ft 8-in wide and 1-ft 10-in deep. When fully assembled it weighs about 168 lb.

At the top of the console is an almost vertical main control panel, below which is an inclined surface for scripts. Beneath this is a recess containing a jackfield. The remainder of the front of the console is occupied by two doors, behind which are two panels PN3/23 equipped with amplifiers, a power supplier, and miscellaneous plug-in units.

At the rear of the console, level with the jackfield and concealed by a dust cover, is a transformer panel carrying all repeating-coils and also two tagstrips between which are formed all losspads except for some on the back of the control panel. At the base of the rear is a panel for making all external connections, both to the tape machines and to the static circuits of the area in which the console is installed.

An intercom loudspeaker is mounted on a small baffle-plate in the left-hand side of the console, and an intercom microphone is mounted on the top of the console, from which it projects up to 10 inches. At the top, on the left-hand side, is a telephone handset Type 713.

An Eddystone box containing the telephone unit switching is mounted at the back under the main control panel, and is connected to the console via a plug and socket arrangement.

The console is intended for permanent installation, normally in a sound recording channel.

Control Panel (Fig. 2)

Main Sections

The control panel is divided into five main sections by deeply engraved bold white lines which split up the panel as shown in Fig. 2. These five sections carry the following groups of controls:

(a) Replay Controls (bottom left section)
(b) Record Controls (top left section)
(c) P.P.M. Monitoring Controls (top right section)
(d) Loudspeaker Monitoring Controls (centre right section)
(e) Miscellaneous and Intercom Controls (bottom right section)

Replay Controls

The replay controls consist of three groups, one per machine; each group comprises a stereo fader, and remote-facilities controls. There is also a single key for tone. The stereo faders, Painton PNN/25M/1S, are used to vary the replay output levels from the machines to the mixing network.

To the right of each fader are two lamps, a green *Rep.* lamp and a red *Rec.* lamp, which show the mode in which the machine has been preset to operate. Below the red lamp is a *Run* pushkey which can be used to start the machine when it is set for remote operation; this key lights internally when the machine is running. Above the green lamp is another pushkey, marked *Distant.* When this key is depressed, the remote control circuit is rerouted to a distant control point such as a studio desk, where the same facilities as on the console may be made available; this key also lights internally when operated.

Above machine-1 fader is a three-way locking key marked *Cont. Tone/Prog./Seql. Tone.* In the central *Prog.* position, this key connects the outputs of the three faders to the subsequent circuit, but in the *Cont. Tone* or *Seq. Tone* position it substitutes continuous or (where available) sequential tone.

Record Controls

A stereo 23-step record level control is provided to adjust the incoming signal to the desired level for recording. There is also a stereo balance control, to move the stereo image from left to right or vice versa; this is calibrated in 0.5-dB steps and provides up to 2·5 dB of shift in either direction.

Three keys provide for routing the signal to the record circuits of the three machines. These keys are a three-way locking type, with a central *Off* position; they are moved down to record programme and up to put tone on the machines. This tone may be either continuous or sequential, depending on the setting of a two-way locking key.

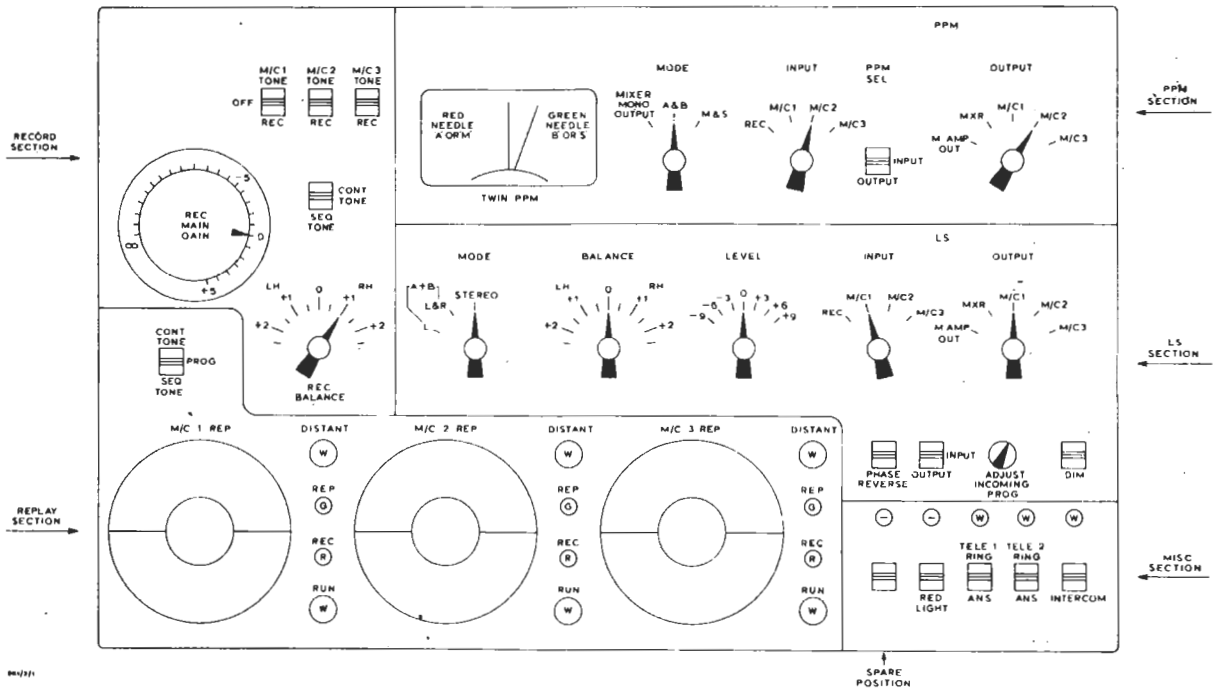

Fig. 2. Control Panel of DK1/3

P.P.M. Monitoring Controls

The signal to be monitored is selected by a key and two rotary switches. One switch selects record or input functions and the other selects replay or output functions. The key is a two-way locking type labelled *Input* and *Output* and manipulation of this key in conjunction with the switches permits comprehensive checking directly between input and output versions of the same signal.

The *Input* selector switch can select either the record input signal to the console, or any of the three direct record inputs to the machines at the record output points on the console. The *Output* selector switch selects any one of the three machine replay outputs, or the mixer output, or the mono $(A + B)$ output.

These two selector switches and the key operate in stereo, and a third switch selects $(A + B)$, $(M + S)$ or mono signals. This switch can put the A and B signals directly onto the twin (red and green) needle P.P.M., or convert them to M and S signals before putting them onto the twin needles, or can put the console mono output onto the red (left-hand) needle only.

Loudspeaker Monitoring Controls

An *Input/Output* key selects between the outputs of two selector switches as for P.P.M. monitoring already described. The same nominal positions are provided on the switches, but there are some additional circuit complications.

To compensate for the effect of the *Rec. Balance* control, which puts attenuation into one or the other side of the stereo signal, a level control (marked *Adjust Incoming Prog.*) is included in the *Record* position circuit of the *Input* selector switch, so that during comparison checking between inputs and outputs, the same total volume can be obtained from the monitoring loudspeakers irrespective of the shift given by the *Rec. Balance* control.

A *Phase Reverse* key is also provided, which operates on the *B* or right-hand leg of the stereo pair of signals. This permits phasing checks to be made, and allows any reversal in loudspeakers or elsewhere to be corrected without wiring changes.

A rotary *Level* switch gives variations from +9 dB to −9 dB in 3-dB steps on the normal loudspeaker setting, and a *Dim* key reduces the loudspeaker level by about 15 dB.

A loudspeaker *Balance* control provides variable attenuation for the *L.H.* or *R.H.* loudspeaker. This control is an 11-position switch giving 0·5-dB steps and is used to compensate for minor variations in the loudspeaker amplifiers and so on.

A three-position *Mode* switch provides:

(a) *Stereo*, with the A and B signals respectively on the left and right-hand loudspeakers.
(b) $(A + B)$ signal on both loudspeakers.
(c) $(A + B)$ signal on the left speaker only.

Miscellaneous and Intercom Controls

An *Intercom* key is provided for use in a circuit between a studio and the recording room. This key, a two-position non-locking type, connects the console intercom microphone and operates a studio equipment relay.

Two *Tele. Ring/Answer* keys, each with a call lamp above it, are provided for use in conjunction with the P.O. Type-713 handset on the side of the console. These two keys, *Tele.1* and *Tele.2,* are normally routed to the control room and to the source/destination. The keys can be used either independently or together, when they parallel the control room, the source/destination and the DK1/3 operator. Incoming calls provide a buzz for about five seconds and, if unanswered, leave the appropriate call lamp alight.

A *Red Light* key is fitted to the left of the two telephone keys. This key is a locking type, and can operate either the recording room local red transmission light, or (in conjunction with studio switching) the studio red lights. The lamp above the *Red Light* key is not wired.

There is an unused key-and-lamp position to the left of the *Red Light* key.

Control Panel: Constructional Details

The control panel is hinged along its bottom edge, and may be lowered forward after releasing two coin-operated pan-head screws at the two top corners.

Four rows of tagstrips are mounted behind the panel on a shelf at the base of the panel. All loss-pads and terminating resistors are mounted on these tagstrips, except for some mounted on the transformer panel described later.

All the rotary switches on the control panel are of the Elma 0 3 series, fitted with hard gold-plated contacts to ensure long life and minimum contact noise.

Jackfield

This is a five-row jackfield, Type JF/115, on which all programme circuits appear at 0 dB. Break-jacks are designated in red lettering and all other jacks in black. Palladium contacts are fitted to all break-jacks, except for two eight-point jacks mentioned below. The main input and output connections are on rows two and four, rows three and five being mostly listen jacks.

On the bottom row (row one) are connections to the associated studio's cubicle inputs, normally innered to the machine outputs immediately above them. There are also three jacks (*A*, *B* and *M*) to a source selector (if used), jacks to the UN5/1, two three-jack parallels, a phase-reversing pair of jacks and a jack which can be routed to studio talkback if required.

Row two has jacks for the three machine outputs, the mixer output (stereo and mono), the cubicle recording lines, the output of each tape machine's record select key, two tie-lines to the control room (in B.H. London installations) and telephone line 1. Row three provides listen jacks, except for jack 20, which gives a 600-ohm termination.

Row four jacks 1 to 17 comprises the three stereo mixer inputs, three jacks to the recording room wall-box, and the record inputs to the record switching and to all three machines. Row five jacks 1 to 17 comprises listen jacks. The last three jacks in rows four and five are loudspeaker inputs *A* and *B*, sequential tone, P.P.M. inputs *A* and *B*, and continuous tone.

The two record input jacks to the record switching, on row four, are eight-point jacks which when plugged up send a signal via their auxiliary contacts to indicate the selection at the source concerned. These jacks are labelled *Rec. Ch. Input.* (See Fig. 5.)

Amplifier Panels

General

The two amplifier panels are mounted behind hinged doors below the jackfield as previously stated. Some of the amplifiers have level controls on the front, but as these do not need adjustment during operation, the doors should normally be kept shut to exclude dust and prevent accidental distrubance of control settings.

Upper Panel

At the right-hand end of this panel is a power supplier PS2/9 or PS2/49 providing about 300 mA d.c. at 24 volts for the amplifiers. As these two power suppliers have their rear connectors in different positions, two sockets are provided to permit interchangeability. Although the PS2/9 has a lower current rating than the PS2/49, either unit is adequate.

Next to the power supplier an OS2/15 oscillator can be plugged in for use in areas where station tone is not normally available.

The two centre positions are occupied by a pair of ME12/4 amplifiers to drive the twin movements of the P.P.M., and immediately to their left is a double amplifier AM9/6 which provides preamplification for the ME12/4s. Each half of the AM9/6 is set to a gain of 19 dB.

Next to the AM9/6 is another double amplifier, Type AM9/6A, which preamplifies the feeds to the loudspeakers. The AM9/6A is similar to the AM9/6, but uses external level controls. These controls (Fig. 3) are mounted in a CH1/18C chassis which occupies the remaining position on the amplifier panel. The normal gain setting for each AM9/6A section is 40 dB. The two controls can be used to 'centre' the loudspeaker *Balance* control on the main control panel.

Lower Panel

The first three positions on the lower panel are occupied by three AM7/4 amplifiers which are respectively the *A*, *B* and Mono mixer-output sending amplifiers. These amplifiers have adjustable gain controls; the *A* and *B* amplifiers are normally set to 43 dB gain and the Mono amplifier to 37 dB gain. To

the right of the AM7/3s are two AM7/4s; these are incoming record signal distribution amplifiers and have a fixed gain of 25 dB.

The next position is spare, and the last two positions, 7 and 8, carry the intercom loudspeaker amplifier and microphone amplifier (Fig. 3a) in areas where the DK1/3 intercom amplifiers are used. Normally, however the intercom amplifiers are external to the recording channel; the desk amplifiers are then not fitted and the circuits are wired straight through the amplifier sockets.

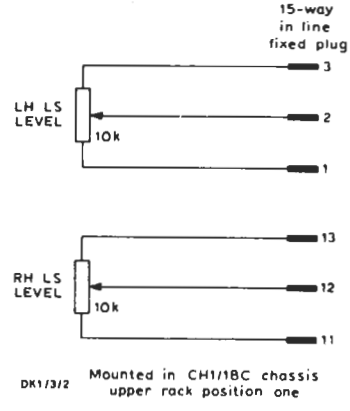

Fig. 3. Preset Loudspeaker-level Controls

Transformer Panel

General

The transformer panel is mounted behind a cover about halfway down the rear of the DK1/3. The panel can accommodate up to 16 transformers, although only 14 are fitted, and it carries two 60-way tagstrips on which various loss-pads are formed.

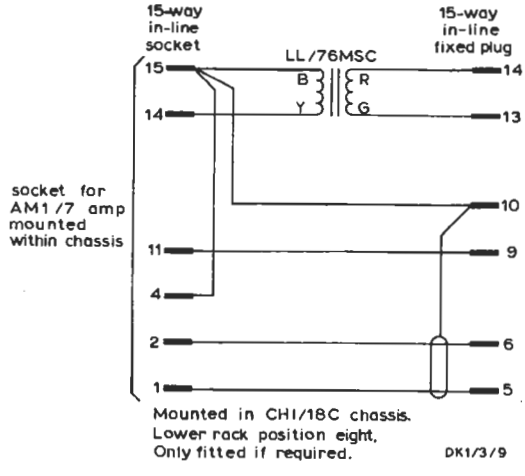

Fig. 3a. Intercom Microphone Amplifier Connections

Transformers

The first six transformers, Type LG/47S, are connected in the three tape machine's repro output lines to the DK1/3 mixer, and unbalance these lines before the signals pass through the (unbalanced) faders and into the main star mixer. Transformers 7 and 8, also Type LG/47S, unbalance the record input signal to allow an unabalnced fader to be used before the signal goes into its distribution amplifier.

Transformers 9 and 10, Type LG/17S, isolate, unbalance and attenuate the continuous and sequential tones respectively before adding one of them to the combined repro output in place of the signal from the star mixer, if a tone is selected by switch SW16.

Transformers 11 and 12, Type LL/106S, balance the outputs of the two halves of the AM9/6A amplifier before the signals are fed out to the loudspeaker connectors.

Transformers 13 and 14, Type LL/52S, isolate and reduce by 3 dB the continuous and sequential tone signals before these are fed to the tape machine record inputs via switches SW12, SW13, SW14 and SW15.

Transformer positions 15 and 16 are normally unused.

Loss-pads

On the two 60-way tagstrips, loss-pads are formed for the following purposes:

(a) to reduce the record input level to the −14 dB required by many tape recording machines, although in recent installations 0 dB is fed to the machines, and this requirement does not arise,
(b) to reduce the tones to the required levels,
(c) to derive a Mono repro output from the Stereo signal leaving the star mixer.

All other loss-pads are formed on tagstrips on the main control panel.

Telephone Unit

This unit is contained in an Eddystone box above the transformer panel. It is connected via a 23-way miniature Painton plug mounted on the end of the box and a free 23-way socket attached to the main cableforms. A Gents 24-volt Duo-Tone buzzer mounted on the outside of the box sounds when the telephone is rung. The box contains the buzzer-operating circuit and a UN10/12 handset-connection unit, and also has provision for an E.M.X. throwback unit if required.

Rear Connector Panel

All connections external to the DK1/3 are made from this panel. The main connector on the panel is a large circular 76-way McGeoch plug which is connected with a corresponding wall-socket via a double-ended cable. All incoming and outgoing programme, telephone, intercom and switching circuits pass through this cable, except for the mains supply and the circuits to the three tape machines.

Continued overleaf

To the right of the McGeoch plug are three 50-way Hypertac sockets for connection to the tape machines via double-enders constructed to Drawing No. SPSK 1176 A3. The pin allocation for the tape machine connectors is standardised as shown in Fig. 4.

The mains supply is brought in via a 3-pin XLR mains connector, also on this panel, and provision is made for an additional mains outlet to be fitted into a normally unequipped rectangular hole at the top left-hand corner of the panel.

Also on the connector panel is a row of five one-amp fuseholders. These carry fuses for the three tape-machine 50-volt supplies and the console supply, leaving one spare fuse position.

Programme Circuit (Fig. 5)

The programme circuit may be considered in two parts, the replay circuit and the record circuit.

Replay Circuit

The tape repro output signals are brought to the tape linking console via the Hypertac double-ender and plug-and-socket system and are then taken to the outers of the tape replay output jacks on the jack-field. The inners of these jacks are wired to the inners of the mixer input jacks and thence via an LG/47S transformer in each half (*A* and *B*) of the chain to the twin replay fader PNN/25M/1S. The circuit is un-balanced after the transformer.

After the fader, the signal passes into the star

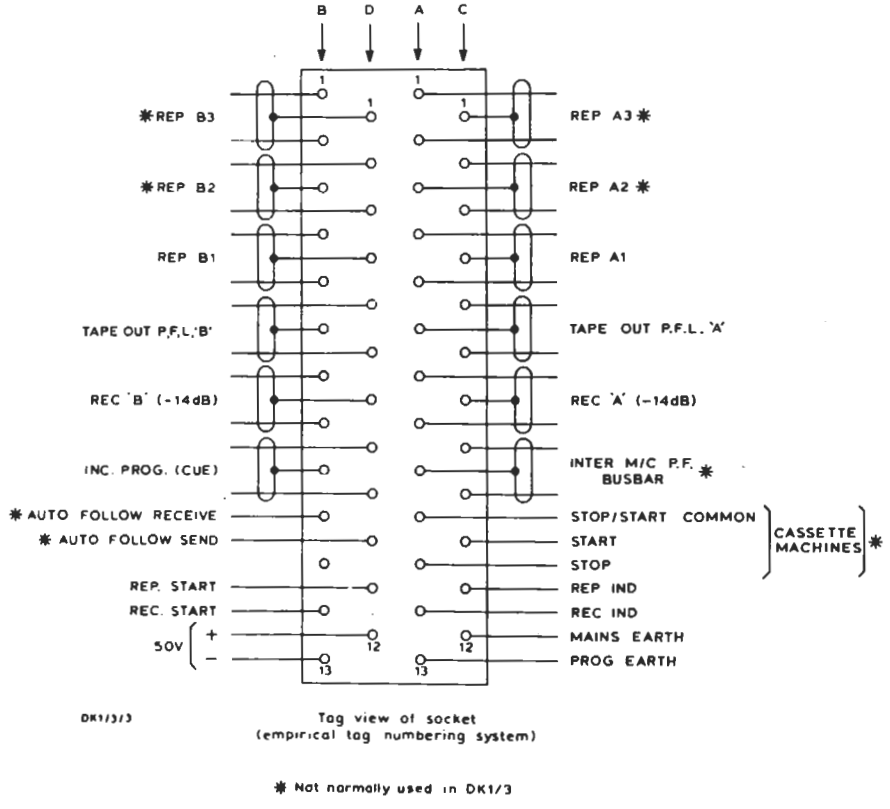

Fig. 4. Hypertac Socket: Pin Allocations

Cableforms

The principal cableform runs up the right-hand side of the console, interconnecting the rear connector panel, both amplifier panels, the transformer panel, the jackfield, the main control panel and the intercom microphone.

A secondary cableform runs up the left-hand side of the console. This cableform connects the rear connector panel to the intercom loudspeaker, the telephone unit, the telephone handset and the miscellaneous part of the main control panel.

The mains cabling runs direct from the mains input socket to the powet supplier on the upper amplifier panel.

mixer, the output of which appears on the *Prog.* position of switch SW16. Continuous and sequential tone are available on the other positions of SW16. The tones are fed from their incoming lines via LG/17Ss, used as balance/unbalance transformers, and pads to reduce the level to −46 dB; this is 3 dB below the signal level, and so allows for the coherence of a tone signal when applied to both halves of a stereo system.

The output of SW16 is taken to a pair of AM7/4 amplifiers set to 43 dB gain. The unbalanced sides are earthed at these amplifiers. The outputs of the amplifiers are fed to the jackfield, and also to two 40-dB pads the low-level sides of which are joined together, thus generating the mono or (*A* + *B*) signal.

The circuit then passes through a third AM7/4

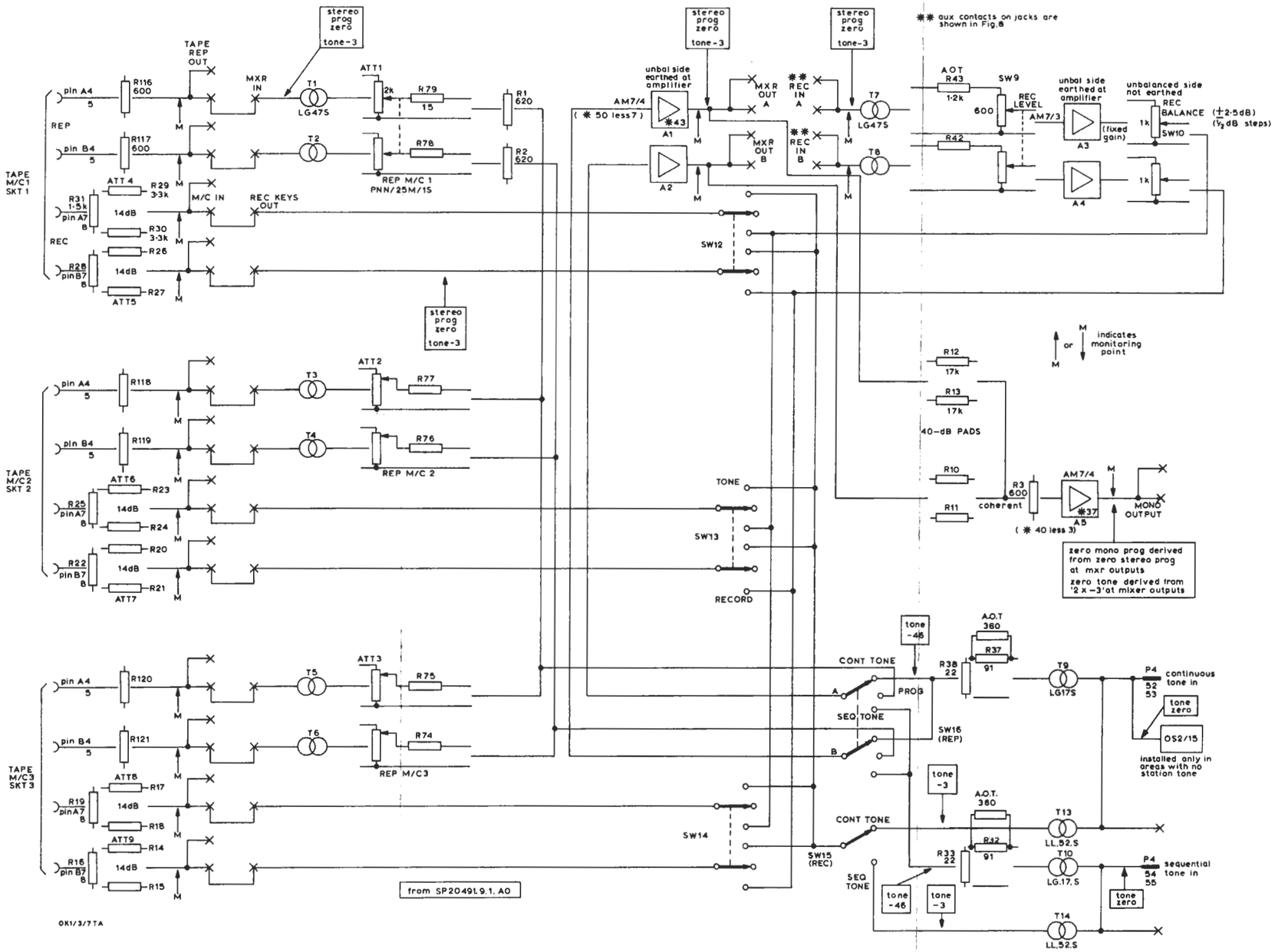

Fig.5. Main Programme Chain of DKI/3

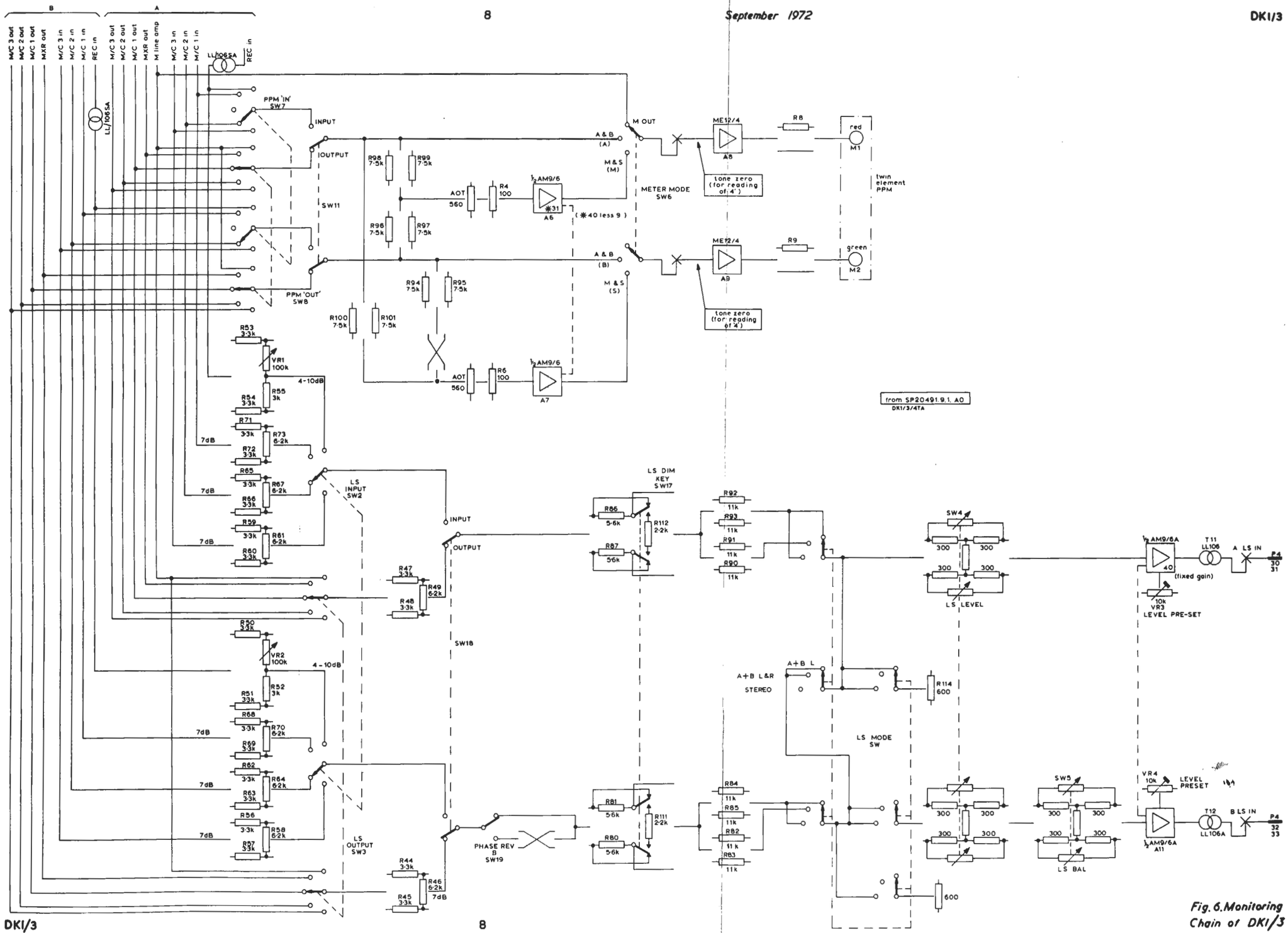

Fig. 6. Monitoring Chain of DK1/3

amplifier, which is set to 37-dB gain to allow for an average coherence of 3 dB under stereo conditions and give a zero-level mono output. This also means that the line-up tone level at this point will be zero, as the tone appeared on the outputs of the *A* and *B* stereo amplifiers at –3 dB, which is the normal stereo line-up level for tone. The mono output is fed to the jackfield.

Record Circuit

The record input is fed from the jackfield to the recording level control via LG/47S balance/unbalance transformers and 1·2-kilohm resistors which drop the level by 16 dB. The recording level control is a twin 23-position stepped attenuator calibrated from +5 dB to minus infinity. (For details see Drawing No. SP 20491.5.8 A3.)

From this attenuator, which for zero-level stereo programme should be on the *0* position with 5 dB in hand, the signal is fed to a pair of AM7/3 distribution amplifiers, at which the unbalanced side is earthed. Allowing for 1·5-dB loss in each transformer (adjusted if necessary by altering the 1·2-kilohm series resistor) the input level to each AM7/3 will be –22·5 dB. As the AM7/3s have a fixed gain of 25 dB, their outputs are thus at +2·5 dB.

The output signals from the AM7/3s are fed to the *Rec. Balance* control, which has 2·5 dB of attenuation in each half, and is adjustable in 0·5-dB steps. The *Rec. Balance* control is used for correcting an asymmetrical stereo image. (For details of this control see Drawing No. SP 20491.5.9 A3.)

The signals from the *Rec. Balance* control are distributed to one position of each of the three machine *Tone/Record* switches SW12, SW13 and SW14. The centre position on each switch is left unconnected, and the remaining position is connected to the output of SW15, which selects either continuous or sequential tone via LL/52S transformers. These transformers, as well as isolating the tone supplies, also reduce the level by 3 dB, giving the correct level for stereo line-up tone.

The *A* and *B* outputs of each *Tone/Record* switch are fed to the outers of *Rec. Keys Out* jacks, which are innered to the *Machine Input* jacks, and then taken via 14-dB pads where appropriate to the record input tags on the Hypertac connectors.

Monitoring Circuit (Fig. 6)

General

Both loudspeaker monitoring and P.P.M. monitoring cover the same points in the programme circuit, and select these points via an *Input/Output* key and *Input* and *Output* rotary switches. The take-off points, marked on the programme circuit diagram (Fig. 5) by a letter *M* and an arrow, are as follows:

Input Selector	*Output Selector*
Machine 1 Input	Machine 1 Output
Machine 2 Input	Machine 2 Output
Machine 3 Input	Machine 3 Output
Record Input	Mixer Output

A further position, Mono Amp Output, is also included on some earlier models of the DK1/3, but on later models this position is stopped off on the switch mechanism and/or not wired. On some machines the position is available on one form of monitoring but not the other.

On the *Input* selector, the Record Input position is wired to the monitoring circuits via a pair of LL/106 transformers, to assist in isolating any incoming longitudinal pick-up, such as clock click interference.

P.P.M. Monitoring

The selected *A* and *B* signals from the P.P.M. *Input/Output* key are taken directly to the (*A* & *B*) contacts of the meter *Mode* switch SW6.

The selected *A* and *B* signals are also combined via two 34-dB pads and fed via a 31-dB AM9/6 amplifier to the *M* side of the (*M* & *S*) contacts of SW6. (The 3-dB difference between the 34-dB loss and the following 31-dB gain allows for the average coincidence of stereo signals.) The *A* and *B* signals are also similarly combined with a phase reversal in the *B* signal, and similarly amplified and routed to the *S* side of the (*M* & *S*) contacts of SW6.

The *M Output* position of SW6 picks up the mono line amplifier output.

From SW6 the signals pass to the inners of the P.P.M. input jacks, the outers of which are connected directly to the meter movements. In all switch positions the P.P.M. monitoring system presents a high impedance to the programme circuit.

Loudspeaker Monitoring

To make the loudspeaker monitoring system present a high impedance to the programme circuit, the *Input* and *Output* rotary switches are built out with resistance networks. For the *Output* switch, the network takes the form of a 7-dB pad on the traveller on each side (*A* and *B*), but for the *Input* switch it is desirable to have a variable attenuator on the *Rec.* position, to compensate for variations in monitoring level caused by the subsequent inclusion of the *Rec. Offset* control. For this reason, a 7-dB pad is wired to each *Machine* position and a variable attenuator giving 7 ±3 dB loss is wired to the *Rec.* position.

After selection at the *Input* and *Output* rotary switches, the signals pass through the *Input/Output* key, and the *B* signal only then passes through a *Phase Reverse* key.

Both signals now pass through a *Dim* key, which can give about 14 dB of attenuation. On earlier models the *Dim* key itself carries the appropriate losspads, but on later models the key operates a relay which carries the pads. This relay can also be operated by the intercom circuits, which have a make contact in parallel with the *Dim* key. Following the dimming losspads both signals are switched by the *Mode* switch, which can select:

(a) Stereo,
(b) (*A* + *B*) to both loudspeakers,
(c) (*A* + *B*) to the left-hand loudspeaker only.

Additional wafers on the *Mode* switch ensure that

the next control in the chain, the balanced symmetrical 600-ohm *Level* control, always works between 600-ohm terminations. The *B* signal only then passes through a *Balance* control; this is a further variable attenuator and is normally set to 2·5 dB but has limits of 0 and 5 dB.

On some later models, the AM9/6A loudspeaker amplifiers have been modified by the addition of 370-pF capacitors across the input connections and earth. This reduces the liability of the circuit to interference pick-up.

Telephone Circuit (Fig. 7)

General

The DK1/3 has provision for two telephone lines. Two *Tele. Ring/Answer* keys and call lamps are provided, one for each line. These keys are non-locking in the *Ring* position and locking in the *Answer* position. There is a jack for telephone line 1 only. The circuit operates as follows.

Outgoing Call

When a *Tele.* key is moved to *Ring*, 17-Hz tone is sent down the line. When the key is moved to *Answer*, the handset is connected to the line via the UN10/12 (which isolates the microphone supply) and the 17-Hz tone is disconnected. The key must be restored to the normal central position when the call has been completed.

Incoming Call

Incoming 17-Hz ringing tone passes through two break contacts on the *Tele.* key and into the telephone unit. It then passes through an attenuation network and filter designed to attenuate signals other than 17-Hz tone and to stop the passage of d.c. The signal path then divides and passes

(a) through a resistor and diode rectifier network onto the control gate of a silicon controlled rectifier which is fired by this means, and allows current to pass through it and light the call lamp for the line, and

(b) through a similar resistor and diode circuit (incorporating a stabilising leak to prevent 'back-door' operation of the lamp for the other line) onto a common wire from both *Tele.* key networks to fire another S.C.R. which permits current to flow through the alarm buzzer.

Moving the *Tele.* key to *Answer* removes the alarm and lamp circuits from the line and connects the handset as previously described.

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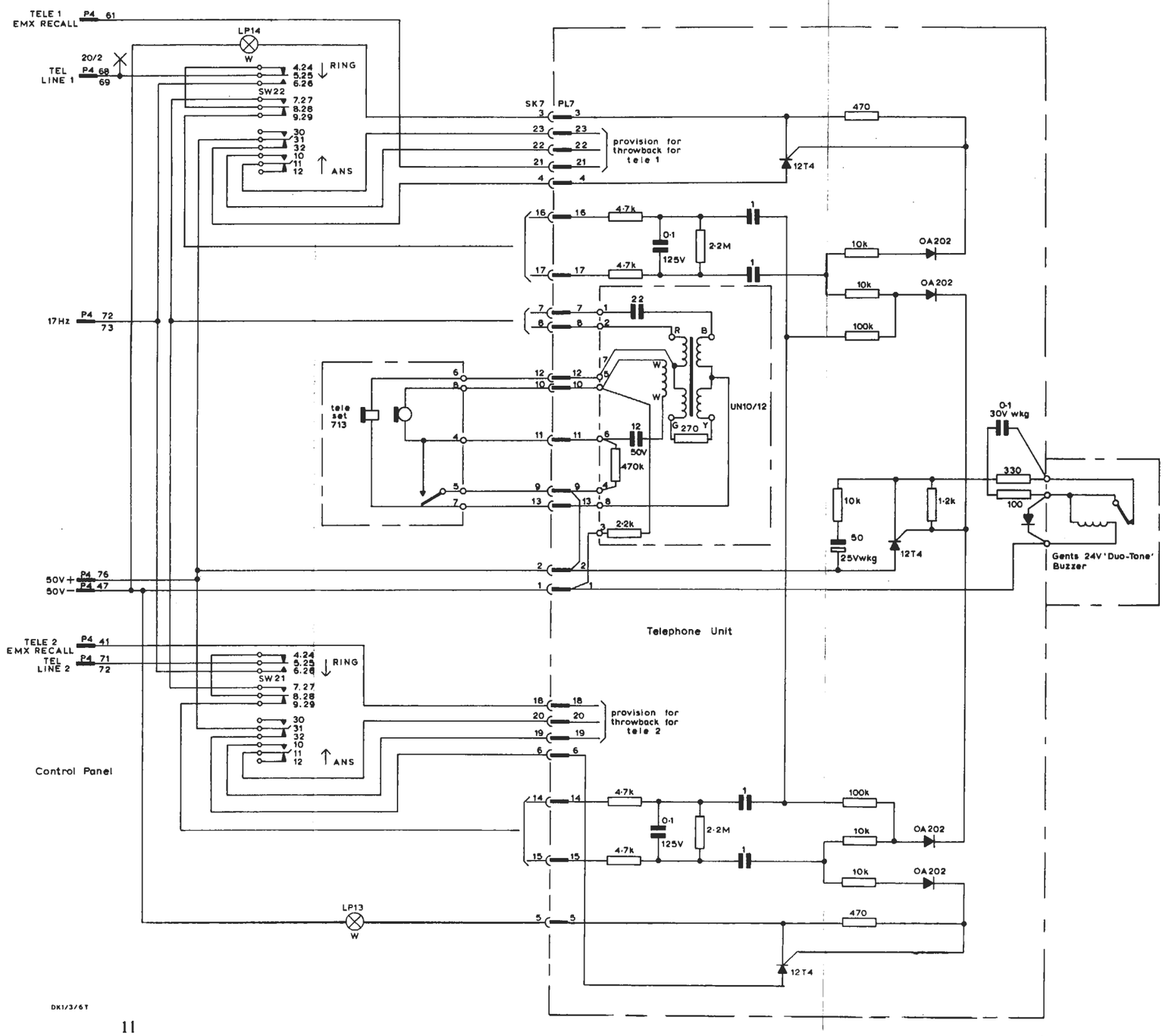

Fig. 7. DKI/3 Telephone System Diagram

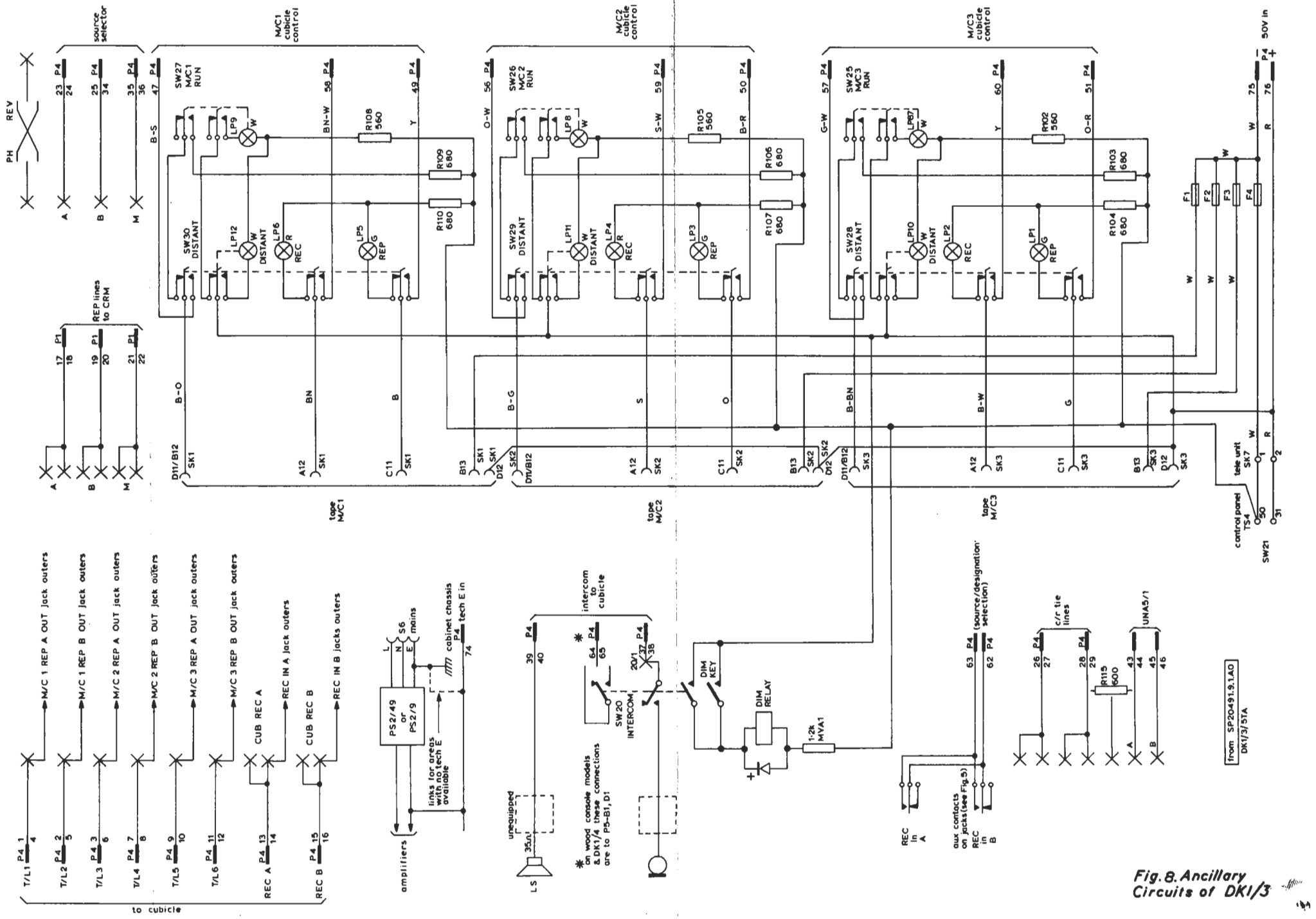

Fig. 8. Ancillary Circuits of DKI/3

Remote Tape Start (Fig. 8)

The remote tape start controls are situated on the replay section of the control panel, there being a set of four controls for each machine. Each set of controls (Fig. 2) comprises a green *Replay* and a red *Record* lamp, and a *Run* and a *Distant* pushbutton, each with an internal white lamp which lights when the button is operated.

The *Replay* and *Record* lamps are lit via an earth from the tape machine control panel, where record/replay selection must be made. The two earth circuits (which cannot both be selected at once) are routed from the tape machine's remote control switch to the DK1/3, where they are wired to the lamps via a pair of break contacts on the *Distant* button. Provided the *Distant* button is not operated, the selected earth circuit lights the red or green *Record* or *Replay* lamp, the other side of which is wired via a 680-ohm resistor to the 50-volt negative d.c. supply. The *Run* button is also wired via the *Distant* button, and its function is to send 50 volts negative via a 680-ohm resistor to the tape machine to operate its start circuit. Each tape machine is operated via a separately fused 50-volt d.c. supply, the fuses being on the DK1/3 rear connector panel.

The *Distant* button reroutes remote control and indication away from the DK1/3 to some distant point such as a studio control desk. The rerouted circuit passes through the channel wallbox and main connector cable to the DK1/3 and back again. In the *Distant* condition, the *Run* key is disabled and its internal lamp cannot light. The *Record* and *Replay* lamp currents are transferred to a distant point for indication there, and the lamps consequently do not light locally.

Miscellaneous Facilities (Fig. 8)

Fig. 8 shows all the circuits mentioned in what follows, except parallel jacks and red light circuit.

Red Light

The *Red Light* key is a single-throw locking type and is wired directly out to the wallbox to allow the red light of the recording channel or an associated studio to be operated as required. The key is mounted to the left of the two *Tele.* keys.

Intercom

The *Intercom* key SW20 on the right of the *Tele.* keys puts the intercom microphone on the top of the console into circuit. The cable from the microphone to the wallbox is routed via the lower amplifier panel for inclusion of an amplifier if necessary. The key when operated also sends a 'make' down a switching line to operate any distant intercom relay switching circuit, and also dims the main loudspeakers on later models equipped with a separate dimming relay. This relay operates via a make contact on SW20 in parallel with the *Dim* key.

The intercom loudspeaker is also wired out to the wallbox via the lower amplifier for possible inclusion of an amplifier.

Some intercom systems require a feed from the microphone at 0 dB. If this is required a talkback amplifier is inserted in the chain as indicated by the dotted outline between the microphone and its SW20 contact in Fig. 8. The amplifier connections are shown in Fig. 3a.

Control Room Tie-lines

There is provision for two tie-lines from the control room to the jackfield via the wallbox.

Housephone Unit UN5/1

Two jacks are designated as inputs to a UN5/1 if the DK1/3 is used in an area fitted with such a unit.

Miscellaneous Jacks

Six jacks are provided as studio cubicle tie-lines and are normally innered to the tape machine *Rep. Out* jacks, so that the studio control desk may pick up the individual machines directly if required.

Similarly, two tie-lines are provided which are innered to the DK1/3 *Rec. In* jacks.

A, *B* and *M* lines are provided from the jackfield for direct routing to the control room, and also for routing to the stereo matrix source selection jackfield in Broadcasting House London control room if required.

A pair of phase-reverse jacks is provided, with their outers cross-connected.

There are two three-jack parallels, and a 600-ohm termination jack.

Source/Destination Switching

Auxiliary contacts (Fig. 8) on the DK1/3 *Rec. In* jacks (Fig. 5) send a short-circuit to line when the jacks are plugged up. This is to indicate to a remote source that the destination (i.e., the DK1/3) has selected the source in question.

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