MOBILE CONTROL ROOM

TYPE 4013

INSTRUCTION AND MAINTENANCE MANUAL

VOLUME TWO

TALKBACK

Supplied for use with
Equipment Serial No(s) .....

Made on Order No. .....

Customer's Order No. .....

OAU

PYE T. V. T. LTD.
CAMBRIDGE
ENGLAND

ISSUE 1

CONTENTS

SECTION 12 - RADIO CHECK RECEIVER AUDIO DISTRIBUTION

SECTION 13 - TELEPHONE LINES

ADDITIONAL DIAGRAMS

SECTION 1 - PURPOSE OF MANUAL

The purpose of this manual is to provide information on the comprehensive talkback, telephone, and cueing facilities provided in the mobile control room.

The information is given diagrammatically in the form of functional diagrams, together with a description of the function covered by each diagram.

Individual details and circuit diagrams of the units used in the various systems described will be found in the separate manuals of the units concerned.

SECTION 2 - PRODUCER'S SYSTEMS

2.1 PRODUCER'S TELEPHONE PART 1

In the LINE TELE position of SWC on the producer's desk the output signal of telephone circuit A (LINE TELE) is passed via the producer's talkback amplifier (in the producer's desk) to the producer's headset, and the LINE TELE calling light and buzzer are cancelled.

Talkback from the producer's microphone (desk or headset) is routed into the audio auxiliary unit to the producer's microphone amplifier. The output of the microphone amplifier is returned to the producer's desk and passes via SWK, the L.S. TELE REPLY key-switch, and SWE (PRIVATE) to SWC. In the LINE TELE position of SWC the signal is routed back to RLF in the audio auxiliary unit, and with RLF de-energised passes to telephone circuit A. When RLF is energised, i.e. when SWC is set to COMM TELE, RLF 1-2 change-over and the signal is transferred to telephone circuit B. The COMM 1 or COMM 2 call lights on the producer's desk are extinguished (if lit) the producer remaining connected to the producer's talkback circuits via the PRIVATE keyswitch SWE. Operation of SWE from PRIVATE will disconnect the producer from talkback.

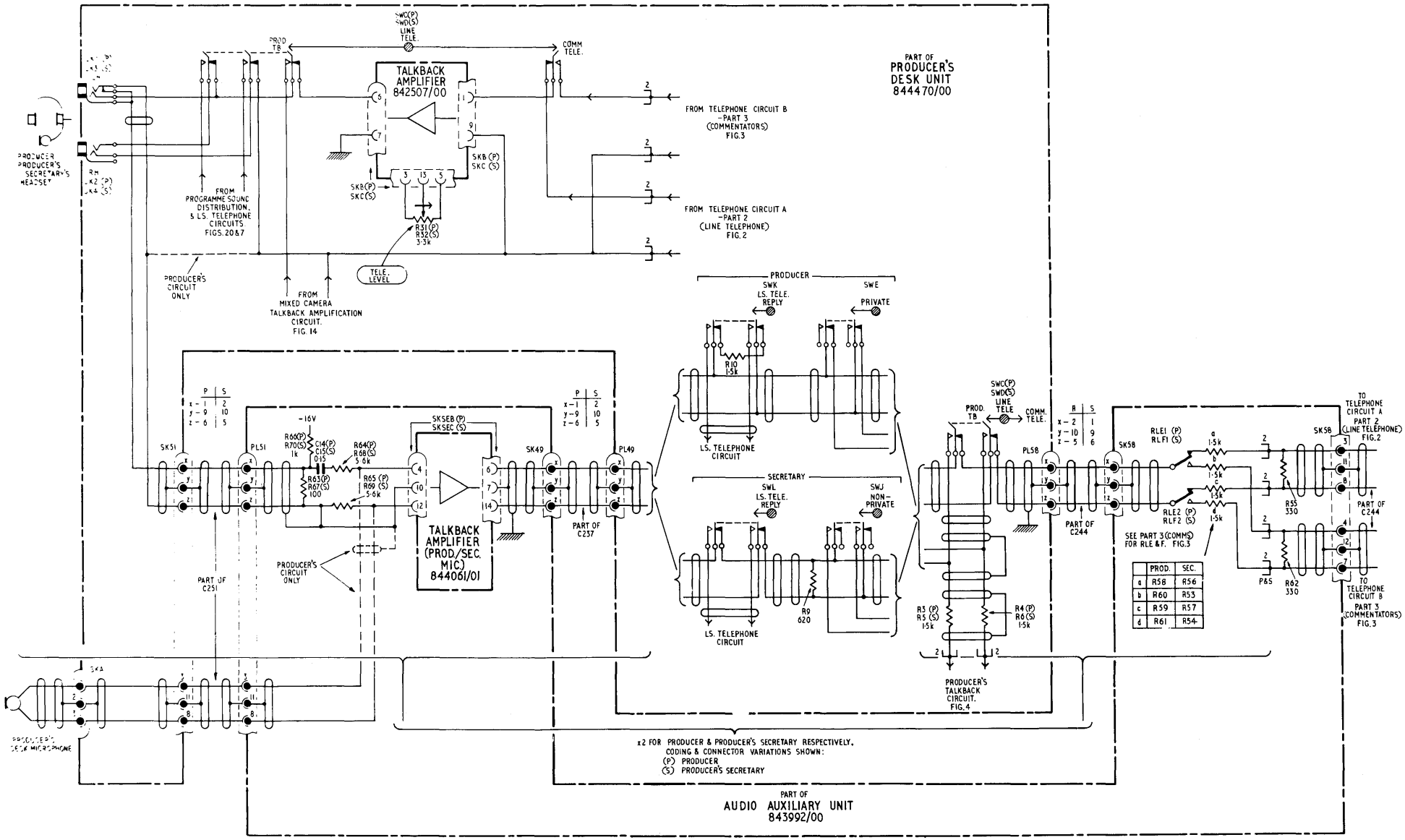
With SWC set to PROD. T.B. mixed camera talkback is fed via R29 to the left earpiece of the producer's headset, whilst programme sound, or loudspeaking telephone talkback, when selected by SWG, is applied to the right earpiece. The output from the producer's microphone amplifier is fed into the producer's talkback circuits.

In all positions of SWC the producer remains connected to PROD TB via SWE (except when SWE is set to PRIVATE).

The functions of the controls on the producer's secretary's side of the producer's desk are as described in the foregoing with the following variations:-

Read SWD for SWC
Read SWL for SWK
Read RLE for RLF
Read producer's secretary's microphone amplifier, and talkback amplifier for producer's microphone amplifier etc.

In the LINE TELE and COMM TELE positions of SWD the producer's secretary is disconnected from PROD TB except when SWJ, (NON PRIVATE) on the producer's desk, is set to NON-PRIVATE.



PRODUCER'S TELEPHONE CIRCUIT - PART 1

DTP2711
(Issue 1)

2.2 PRODUCER'S TELEPHONE PART 2 (COMMENTATORS)

With SWB on the audio auxiliary unit set to NORM, and SWC and SWD on the producer's desk set to LINE TELE or PROD TB, COMMENTATOR 1 unit is connected to RLA and RLC, and COMMENTATOR 2 unit is connected to RLB and RLD, all relays being located in the audio auxiliary unit.

Operation of the keyswitch KA, CALL PROD. (on the commentator's unit) by commentator 1 causes RLA to become energised. RLA3 opens and places R39 in series with the relay coil thus allowing instant 'drop out' when the switch is released. RLA1 closes and operates the buzzer on the producer's desk. RLA4 changes over and transfers the smoothing capacitor (C10) to -24V to prevent switching transients. RLA2 closes and energises RLC. RLC1 closes and latches RLC. RLC2 closes and causes the COMM 1 lamps on the producer's desk to light. RLC is held, and the lamps remain lighted, until SWC or SWD on the producer's desk, is set to COMM TELE, or SWB on the audio auxiliary unit is set to COMM 1.

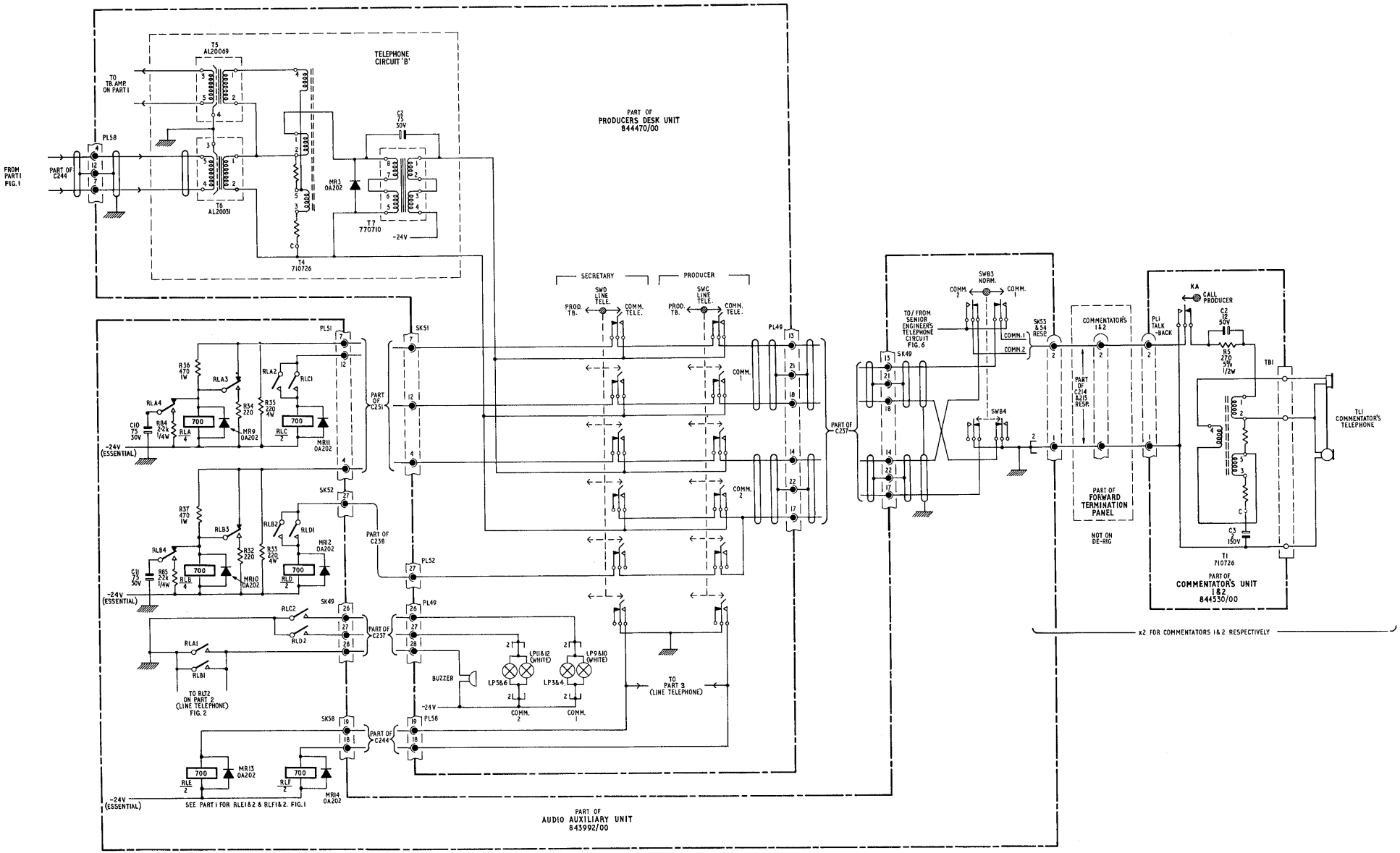
A similar operation will result when commentator 2 operates his CALL PROD keyswitch, RLB will function as RLA, and RLD as RLC.

When SWB on the audio auxiliary unit is set to either COMM 1 or COMM 2 that circuit is disconnected from the producer's desk, and is connected to the senior engineer's position irrespective of the positions of SWC and SWD on the producer's desk.

Operation of SWC on the producer's desk to COMM TELE causes RLF to become energised, and the output of the producer's microphone amplifier transferred to telephone circuit "B" (commentators), the output of telephone circuit 'B' being fed to the producer's headset via the producer's talkback amplifier.

When SWD, on the producer's desk, is set to COMM TELE RLE is energised, the output of the producer's secretary's microphone amplifier is transferred to telephone circuit B and to the producer's secretary's headset via the appropriate talkback amplifier.

Details of the commentator's unit will be found in an appendix to this manual.



PRODUCER'S TELEPHONE CIRCUIT PART 2 (COMMENTATORS)

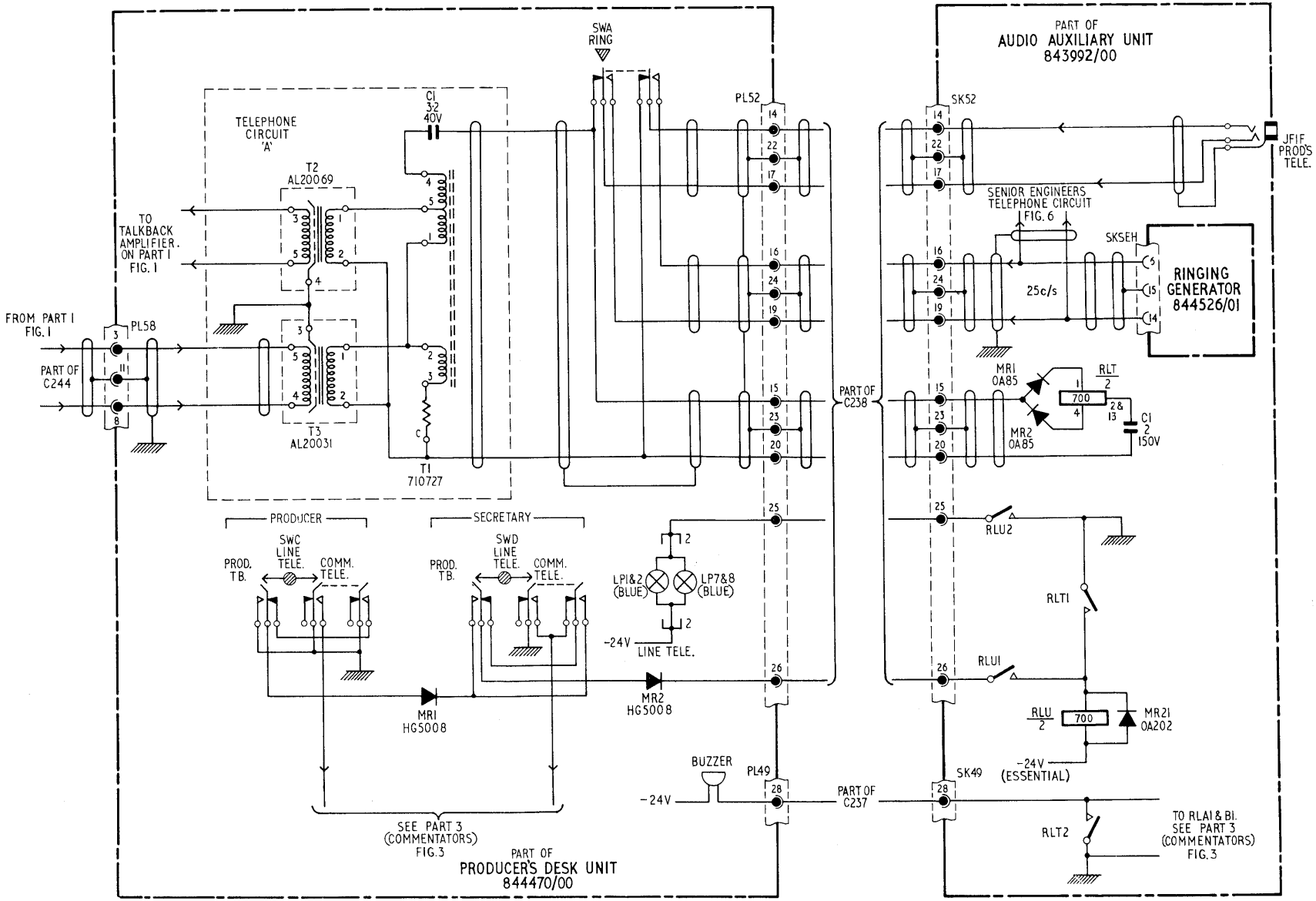
2.3 PRODUCER'S TELEPHONE PART 3 (LINE TELEPHONE)

A signal fed into the producer's telephone jack (JF1F) on the audio auxiliary unit is passed directly to the producer's desk, and in the normal position of SWA, is routed via the telephone coil T1 into the isolating transformer T2. The output of T2 is then connected to the producer's or producer's talkback amplifier.

When a signal is available at PL58 (3-8-11) on the producer's desk, it can be from either the producer's desk microphone, or from the producer's or his secretary's headset microphone. The signal is applied to T3 and passed via the telephone coil and SWA (when SWA is in the normal position) to the audio auxiliary unit. The signal then becomes available at the producer's telephone jack JF1F.

A ringing tone into JF1F will, when SWA on the producer's desk is in the normal position, return to the audio auxiliary unit via SWA and cause RLT to become energised. RLT1 will close and energise RLU, RLT2 will close and cause the buzzer on the producer's desk to sound, RLU latches in on RLU1 (provided neither SWC or SWD, on the producer's desk, is set to LINE TELE) and will light the LINE TELE call lamps on the producer's desk. When the LINE TELE lamps are lit and either SWC or SWD is set to LINE TELE, RLU is de-energised and 'drops out', the buzzer is muted and the lights extinguished.

The two telephone circuits A and B cannot be coupled together, nor can either be connected at any time to PROD TB.



PRODUCER'S TELEPHONE CIRCUIT PART 3 (LINE TELEPHONE)

2.4 PRODUCER'S TALKBACK

The signal from the producer's headset microphone, or the producer's desk microphone, is conveyed from the producer's desk to the producer's microphone amplifier in the audio auxiliary unit. The output signal from the amplifier is then returned to the producer's desk and applied to SWK (L.S. TELE REPLY). Normally SWK is in a passive condition, but when the switch is set to REPLY producer's talkback is connected to the loudspeaking telephone circuit (Intercom). The signal for producer's talkback is also applied to SWE (PRIVATE), the normal position of the switch giving a feed to the producer's talkback distribution amplifier. When SWE is set to PRIVATE the feed is cut, and the talkback signal applied to SWC.

When SWC is set to PROD TB the signal is fed to PL/SK 49 independently of SWE, and to the common input of the producer's talkback distribution amplifier.

The signal from the producer's secretary's headset microphone is fed into the producer's secretary's microphone amplifier in the audio auxiliary unit, returning to the producer's desk and passing to SWL which functions as SWK, except that its operation removes the producer's secretary from the producer's talkback distribution amplifier. From SWL in the normal position the signal is applied to SWJ (NON-PRIVATE) which is normally open. The signal is also fed to SWD. This switch connects the secretary to the producer's talkback distribution amplifier only when set to PROD. T.B., but when SWJ is set to NON-PRIVATE direct connection is made to the common input of the producer's talkback distribution amplifier.

A producer's talkback input and two outputs are fed from the forward termination panel. These are linked to the audio mixing unit and to the common input and output of the producer's talkback amplifier.

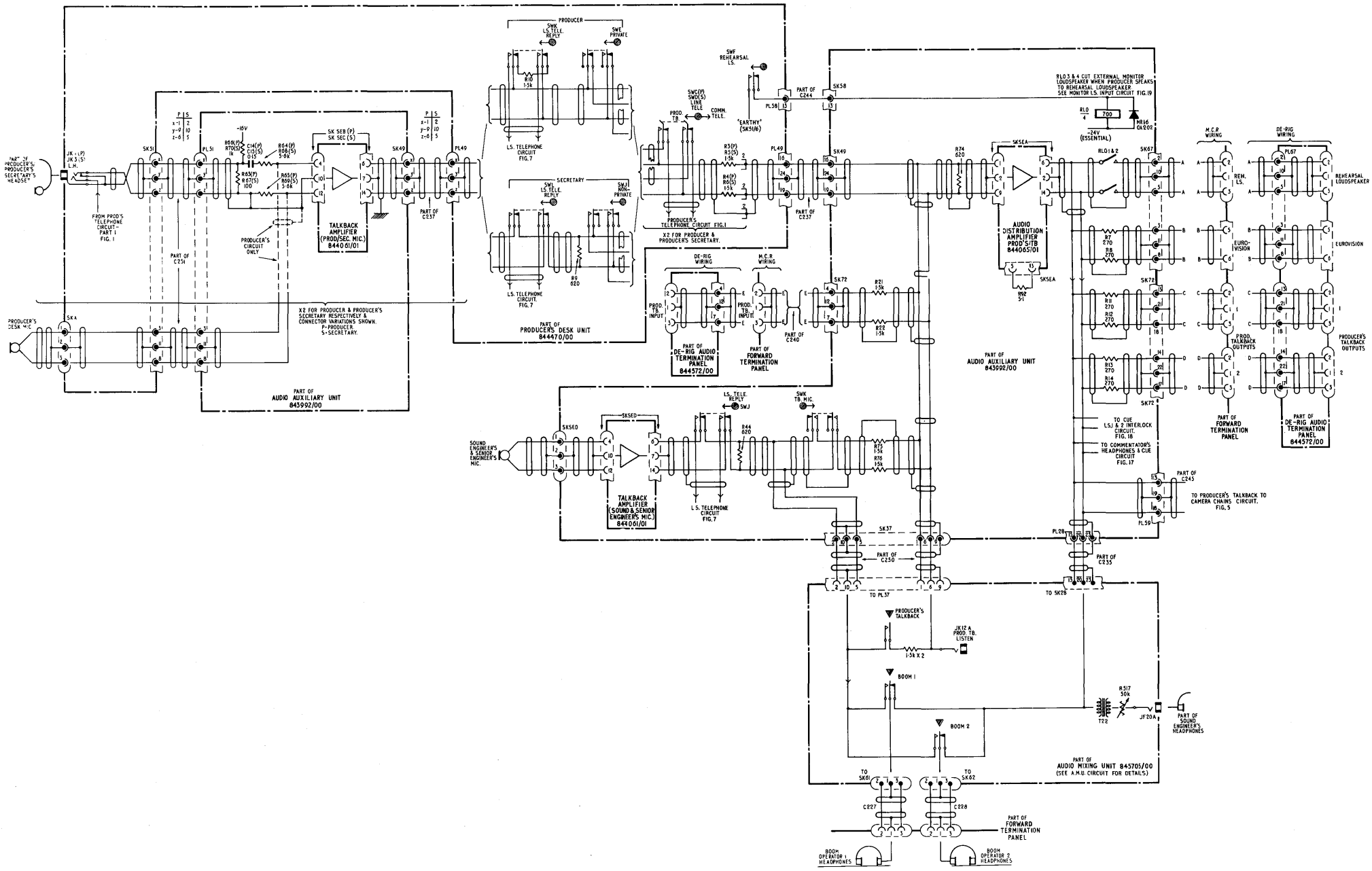
The senior engineer's microphone output signal is fed into the relative microphone amplifier, the output signal of the amplifier is applied to the normal position of SWJ (L.S. TELE REPLY) and passed to SWK (T.B. MIC), (both switches on the audio auxiliary unit) being branched en route to supply information to the boom operators via the buttons on the audio mixing unit.

SWJ, on the audio auxiliary unit, functions in the same way as SWL on the producer's desk unit.

When SWK, on the audio auxiliary unit is set to ON senior engineer's talkback is conveyed to the common input of the producer's talkback distribution amplifier.

All the lines joining the common input to the producer's talkback distribution amplifier are resistively linked to the amplifier input so as to prevent coupling.

Operation of SWF (REHEARSAL L.S.) on the producer's desk will energise RLO, RLO 1-2 will close and connect the output of the producer's talkback distribution amplifier, via the forward termination panel, to a rehearsal loudspeaker. RLO 3-4 open and disconnect the monitoring loudspeaker to avoid feedback. Before the relay the amplifier output is resistively split to a Eurovision output and two producers' outputs on the forward termination panel. Further branches route the signal to the CUE L.S. 1 and CUE L.S.2 circuits, the commentator's headphone circuit, the camera chain circuit and the audio mixing unit operator's headphone circuit.



PRODUCER'S TALKBACK CIRCUIT

DTP2714
(Issue 1)

2.5 PRODUCER'S TALKBACK TO CAMERA CHAINS

Producer's talkback to the vision engineers and camera operators is fed from the audio auxiliary unit into the talkback junction box where it is split into five outputs. Four outputs are used to pass the signal to camera control units 1 to 4 respectively, the fifth output being applied via transformer T3 to the remote vision engineer's desk.

CAMERAS

The signal to each camera chain (1 to 4) enters the camera control unit and its route is divided, one branch passing to the camera control panel, the other being routed via the transformer T6. From T6 the signal is fed via the forward termination panel to the camera. In the camera the signal is transferred from the secondary of T1 to the PROD T. B. potentiometer controlling the auxiliary headphones and headsets (at JK 3, 4, 5, 6, 7 and 8), and to the camera operator's headset (JK1 and JK2), the amplitude of the signal to the latter being adjusted by R33.

VISION ENGINEERS

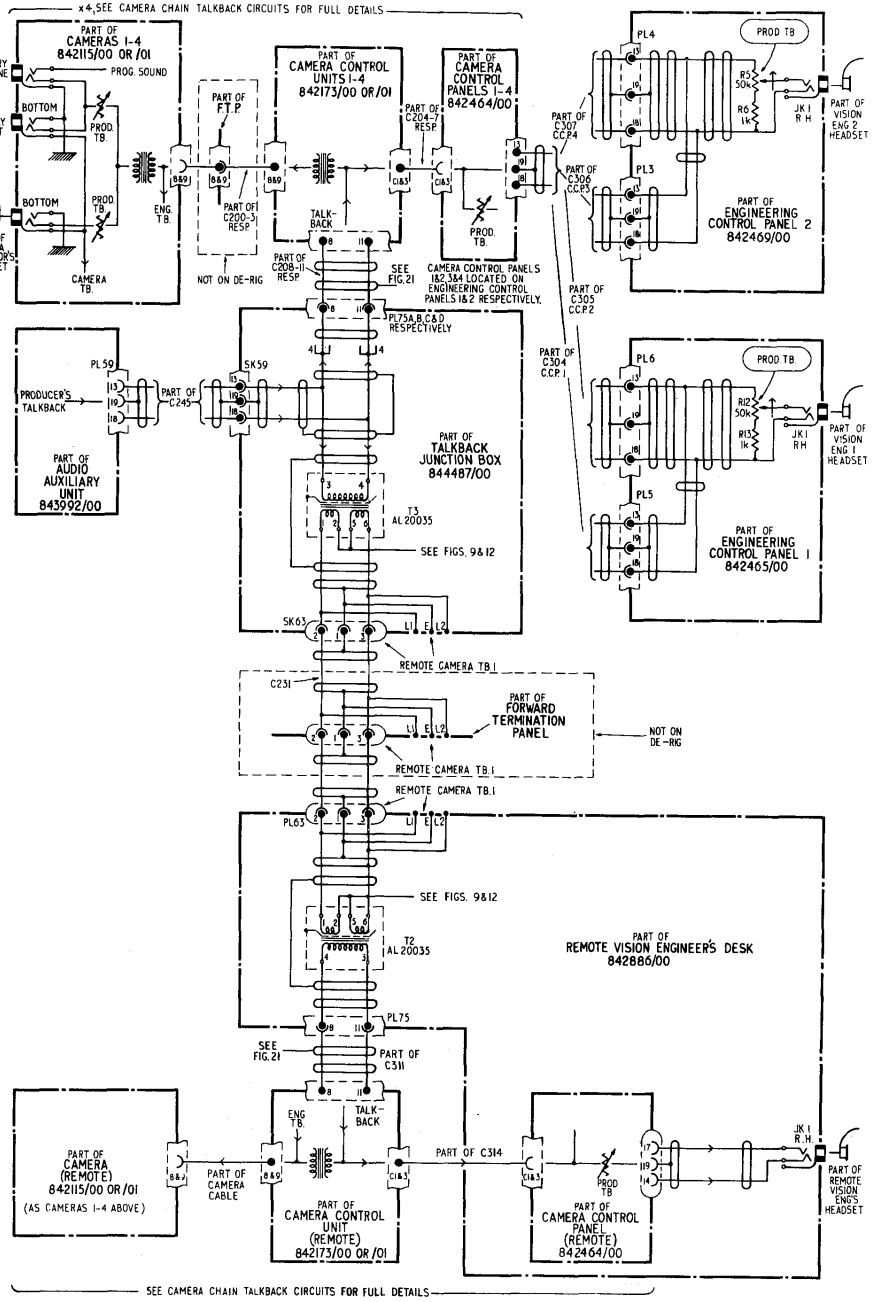
The producers talkback signal from the camera control unit subdivides in the camera control panel making the signal available, via the potentiometer R102, at the headset jacks on the control panel. The branch then continues to the vision engineer's desks.

As indicated on the circuit diagram the routes from camera control units 1 and 2 terminate at vision engineer 1 desk, the signal being fed via the potentiometer R12 to the headset jacks.

The routes from camera control units 3 and 4 terminate at vision engineer 2 desk, being applied to the headset jacks via the potentiometer R5.

REMOTE VISION ENGINEER AND CAMERA

The producer's talkback signal from T3, in the talkback junction box, is routed via the forward termination panel into T2 on the remote vision engineer's desk. From T2 the signal is passed into the remote camera control unit, and is then made available to the remote engineer and remote camera as described for cameras 1 to 4.



PRODUCER'S TALKBACK TO CAMERA CHAINS CIRCUIT

DTP2715
(Issue 1)

SECTION 3 - SENIOR ENGINEER'S TELEPHONE

When the senior engineer's telephone jack (JF3E) is patched to a source, an incoming ringing tone from that source will, if SWD and SWB on the audio auxiliary unit are in the normal position, ring the telephone bell.

Lifting the handset from its cradle will connect the telephone circuit coils to the NORM position of SWC (on the audio auxiliary unit) and to the batteries energising the telephone microphone, at the same time muting the telephone bell. Communication is then established.

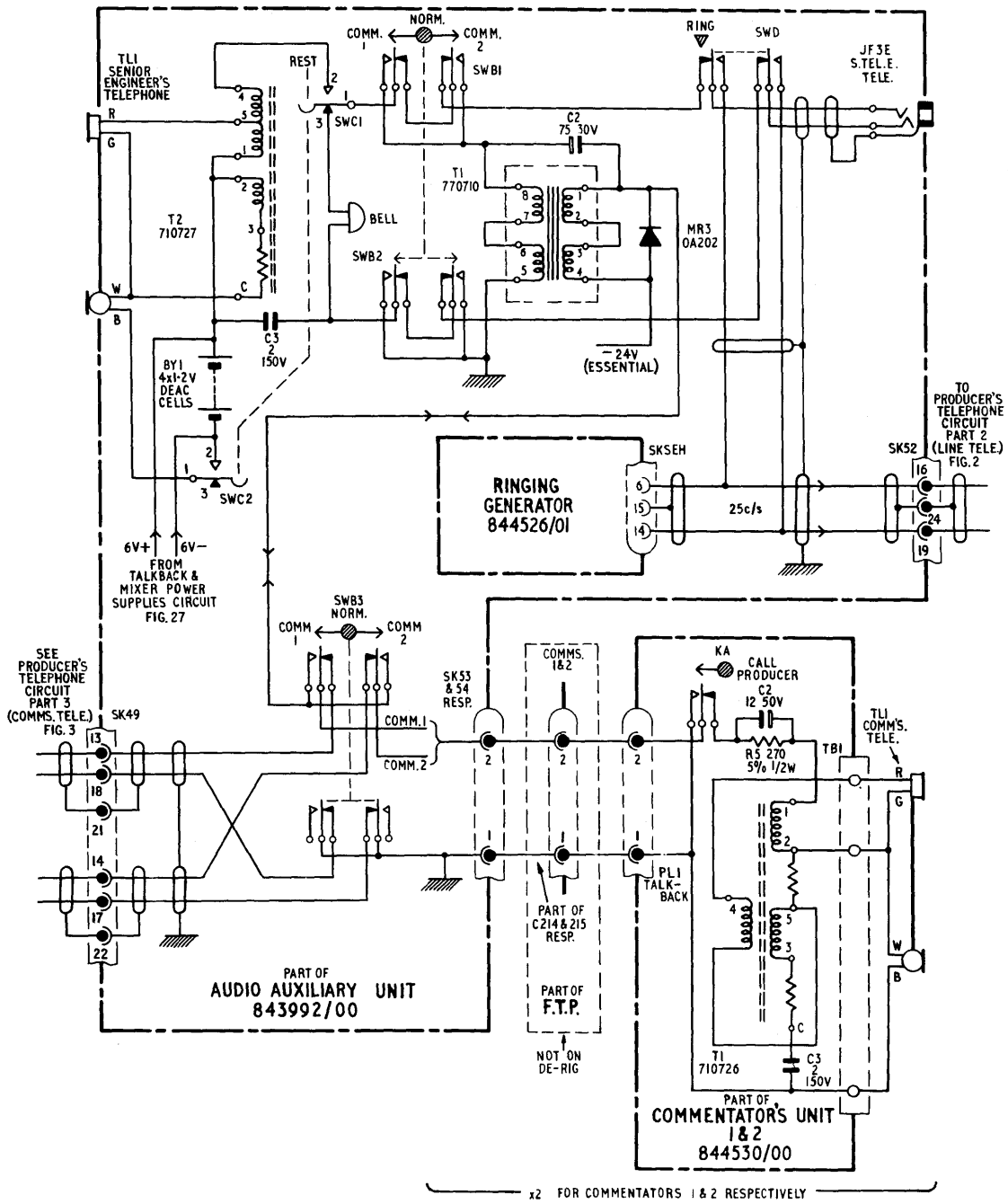
When SWB is in the normal position the commentators are connected to the producer's desk. The commentators call the producer by operating KA (CALL PRODUCER) on the commentator's unit, and direct communication is established.

If the senior engineer wishes to communicate with the commentator he will move SWB to either COMM 1 or COMM 2 as required, this will break the line to the producer, and communication between producer and that commentator is not then possible until the senior engineer restores the circuit.

Whilst the senior engineer is in communication with one commentator it is still possible for the producer to converse with the other commentator or the latter to ring the producer in the normal manner.

Pressing the RING button SWD will apply a ringing tone from the ringing generator to the source connected to JF3E.

A ringing tone from the ringing generator is available also at SWA on the producer's desk for connection as required.



SENIOR ENGINEER'S TELEPHONE CIRCUIT

DTP2716
(Issue 1)

SECTION 4 - LOUDSPEAKING TELEPHONE

The signal path from the producer's headset microphone, the desk microphone, and the producer's secretary's microphone, to SWK and SWL on the producer's desk, is as described for PROD. T. B.

When SWK or SWL is set to REPLY RLH, in the audio auxiliary unit, is energised, RLH 1-2 and 3-4 close and reverse the loudspeaking telephone amplifier, passing the signal to JF4F, the L.S. TELE jack, via the 600 ohm matching transformer T6.

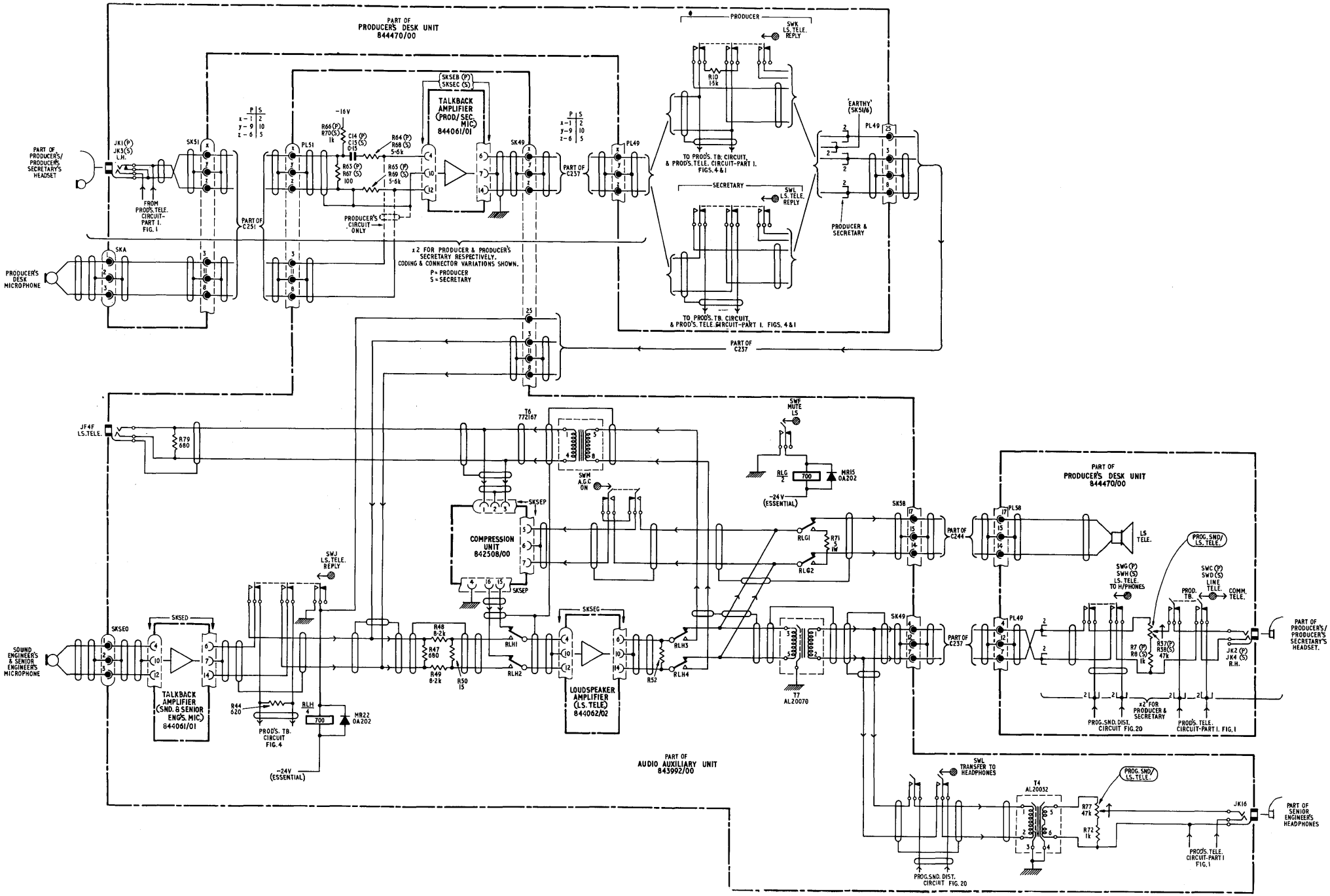
When SWJ on the audio auxiliary unit, is set to REPLY the same operational sequence is effected and the output of the senior engineer's microphone amplifier is fed to JF4F as described for SWK.

Talkback routed into the loudspeaking telephone amplifier from an external source via JF4F is passed via the compression unit which is brought into operation by SWM. In the normal position of RLH the amplifier feeds the 'intercom' loudspeaker on the producer's desk. This loudspeaker may be muted by setting SWF (on the audio auxiliary unit) to MUTE, RLG will then become energised, RLG 1-2 will open and break the lines to the loudspeaker, substituting a dummy load in place of the loudspeaker.

The signal from the loudspeaker amplifier is also passed to the bridging transformer T7, the output of the transformer being fed to all the TRANSFER TO HEADPHONES keyswitches.

In the TRANSFER TO HEADPHONES position SWL conveys the signal to the headsets via an isolating transformer and a potentiometer, replacing the normal programme sound.

The branch to SK49 is connected to the audio auxiliary unit, and is then run in parallel to SWG (producer) and SWH (producer's secretary) L.S. TELE TO HEADPHONES switches which function identically as SWL.



LOUDSPEAKER TELEPHONE CIRCUIT (INTERCOMM)

DTP2717
(Issue 1)

SECTION 5 - VISION ENGINEER'S SYSTEM

5.1 ENGINEER'S TALKBACK

When the CALL/MIC ON key on the engineering control panel of vision engineer 1 is set to MIC ON the microphone becomes energised and the microphone output signal is applied to the input of the microphone amplifier.

The output of the amplifier is made available at SWA, on the vision engineer 1 desk, the position of this switch determining the destination of the talkback signal viz:

Position 1 to Camera 1
Position 2 to Camera 2
Position 3 to Remote Engineer
Position 4 to All destinations

When the switch is set to position 1 the output of the microphone amplifier is passed to the camera control panel of Camera 1, from which unit it is routed via the isolation transformer T6, into the camera control unit.

In the camera control unit the signal passes via T10 into the low-impedance, common-base stage VT87, followed by the common-emitter amplifying stage VT86, a third stage (VT85) being a common-collector connection with negative feedback from the emitter of VT85 to the first stage. The capacitor (C249) across the emitter resistor of VT85 reduces the low-frequency response of the stages.

The transformer T9 gives a low-impedance output into T7, the vision engineer's talkback transformer. The output of T7 is "phantommed" onto T6 and T8, and vision engineer's talkback to camera 1 is superimposed on the lines of these transformers via the forward termination panel. In the camera, vision engineer's talkback is transferred from the phantom circuit on T1 and T2 and is applied to T9.

From T9 the signal is conducted via the volume control R38 to the two stage amplifier (VT26 and VT25) the output signal being fed to JK1 and to the camera operator's headset.

Position 2 of SWA on the desk of vision engineer 1, will route the talkback as described for camera 1, to camera 2.

Positions 3 and 4 of SWA cause the signal to be passed to T2 in the talkback junction box. From T2 the signal is "phantommed" along the programme sound lines, via the forward termination panel, to T5 on the remote vision engineer's desk. The signal is then routed

via SWA to R2 (labelled VISION ENG 1). The amplitude of the signal is adjusted by R2 and the signal is passed into the isolating amplifier on the remote vision engineer's control panel, and routed to JK2 for connection to the vision engineer's headset. SWA, on the remote vision engineer's desk, also mutes the remote talkback to vision engineer 1 to prevent high-level side tones.

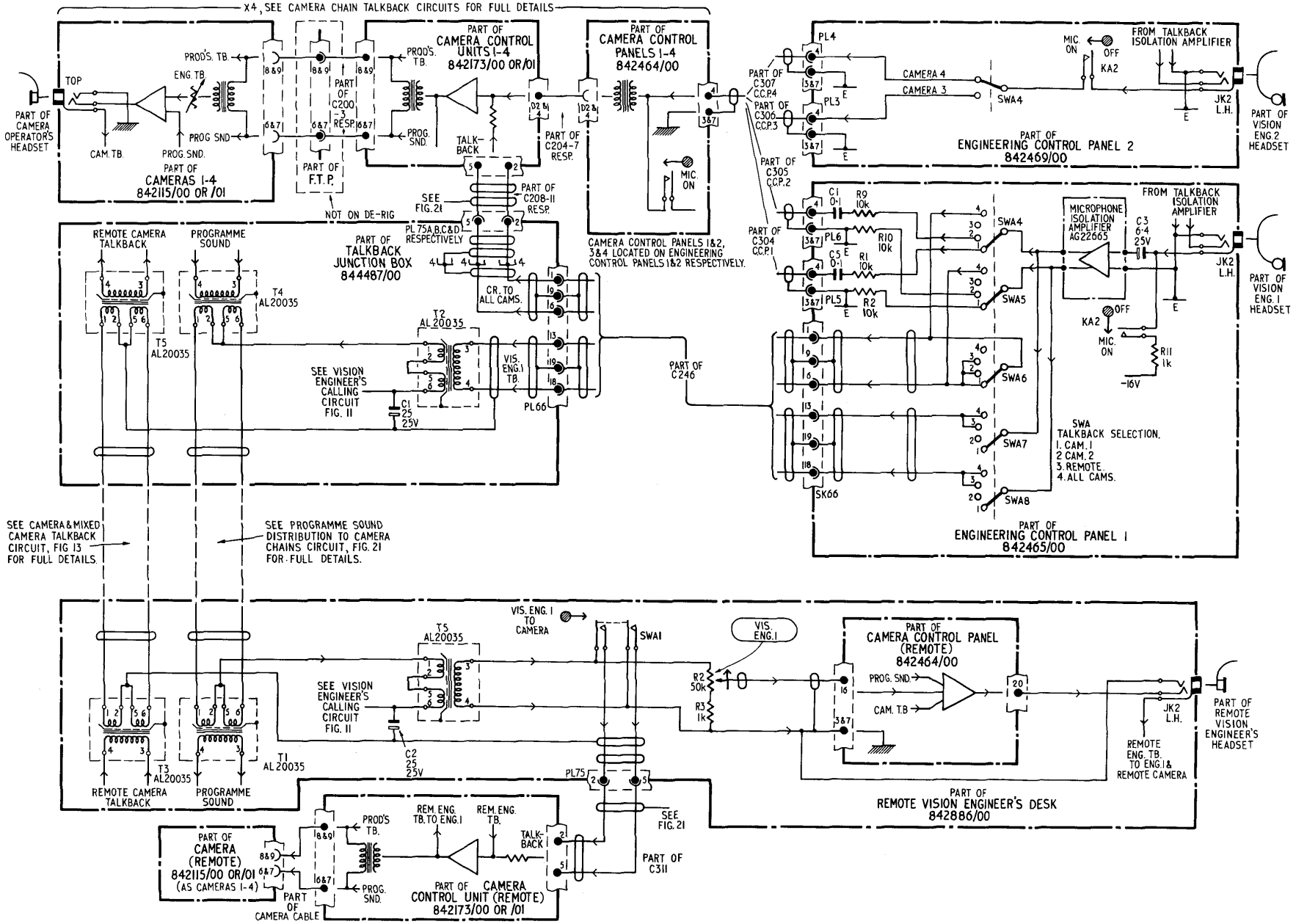
Position 4 of SWA, on vision engineer 1 desk, will route vision engineer 1 talkback to all cameras and to the remote vision engineer, via the talkback junction box.

Vision engineer 2 may communicate with cameras 3 and 4 only, communication being established by engineer 2 setting the CALL/MIC ON switch on his desk to MIC ON, and SWA on his desk to 3 and 4. The talkback signal is routed as described for position 1 of SWA (vision engineer 1).

The power requirements for all vision engineer's communication needs may be provided if necessary, by any one of the four camera control units.

When any individual camera is selected by either vision engineer the appropriate MIC ON switch is set to MIC ON. This will bring the microphone into circuit and also energise a relay (RLA-RLD according to the camera selected) in the talkback junction box.

The relay will route the talkback signal, on the camera circuit selected, to the mixed camera talkback circuits via a 12dB attenuator. The purpose of the attenuation is to prevent the producer being distracted by conversation which is not of immediate interest to him.



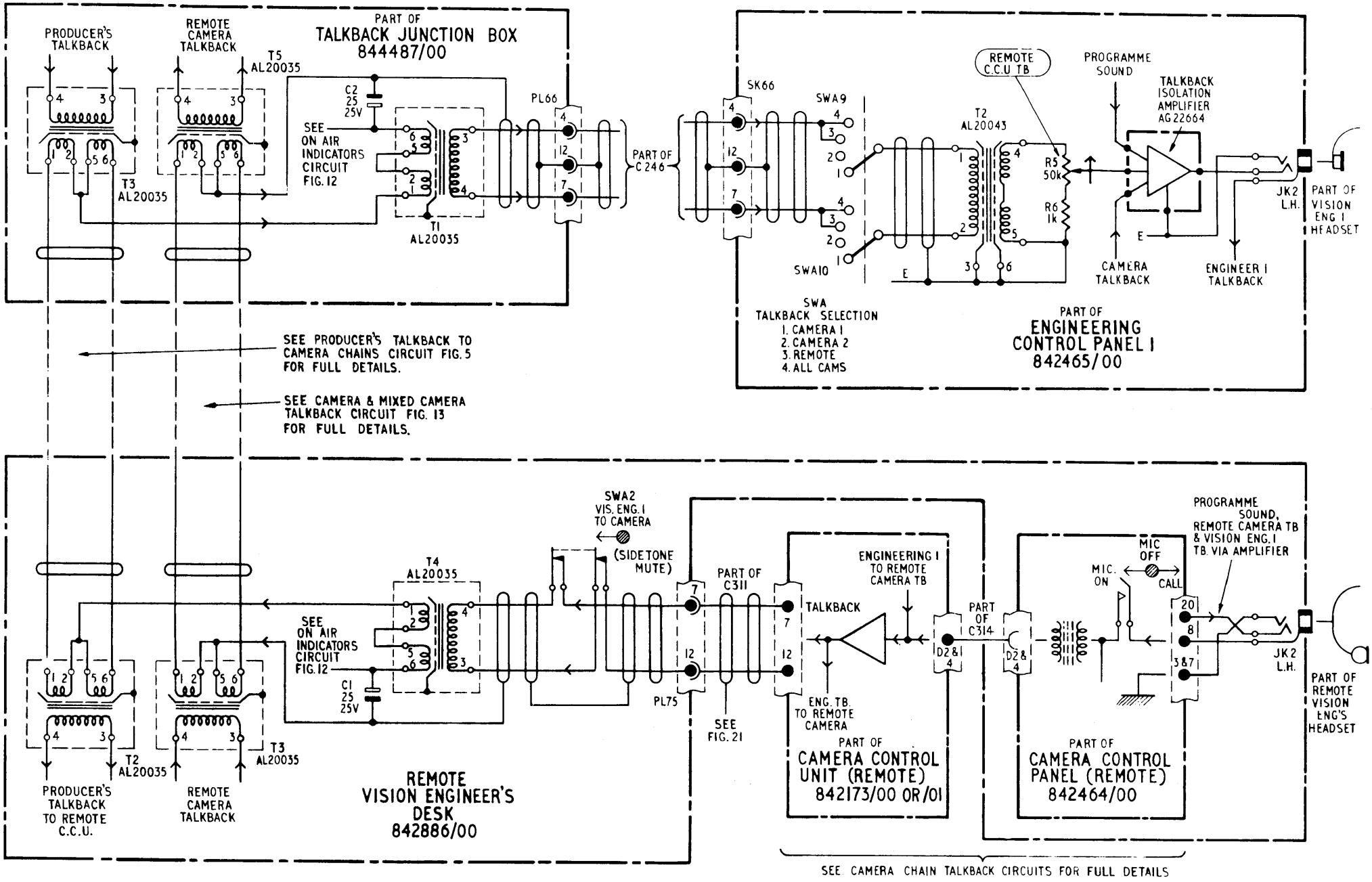
ENGINEERING TALKBACK CIRCUIT

DTP2718
(Issue 1)

5.2 LOCAL/REMOTE VISION ENGINEER'S TALKBACK

The remote vision engineer may communicate with vision engineer 1 by setting the CALL/MIC ON switch on his camera control panel to MIC ON. The microphone output signal is then routed to the talkback amplifier in the remote camera control unit, the output of the amplifier, apart from feeding the camera, returns the signal to the remote vision engineer's desk. The signal is then applied to T4, transferred to the centre-tap of T2 and "phantommed" on the producer's talkback lines to T3 in the talkback junction box. From the centre-tap of T3 the signal is transferred to T1 and routed to SWA on the control panel of vision engineer 1 desk.

From SWA in position 3 or 4 the signal is then routed to the primary of the isolating transformer T2. From the secondary of the transformer the amplitude is adjusted by the potentiometer R5 (REMOTE CAM TB.) and passed into the mixing amplifier. The output of the amplifier is available at JK2 for connection to the left earpiece of the engineer's headset.



REMOTE TO LOCAL ENGINEERING TALKBACK CIRCUIT

DTP2719
(Issue 1)

5.3 VISION ENGINEER 1 TELEPHONE

This telephone may be used into any telephone line and is capable of full operation and ringing without the provision of a separate power supply.

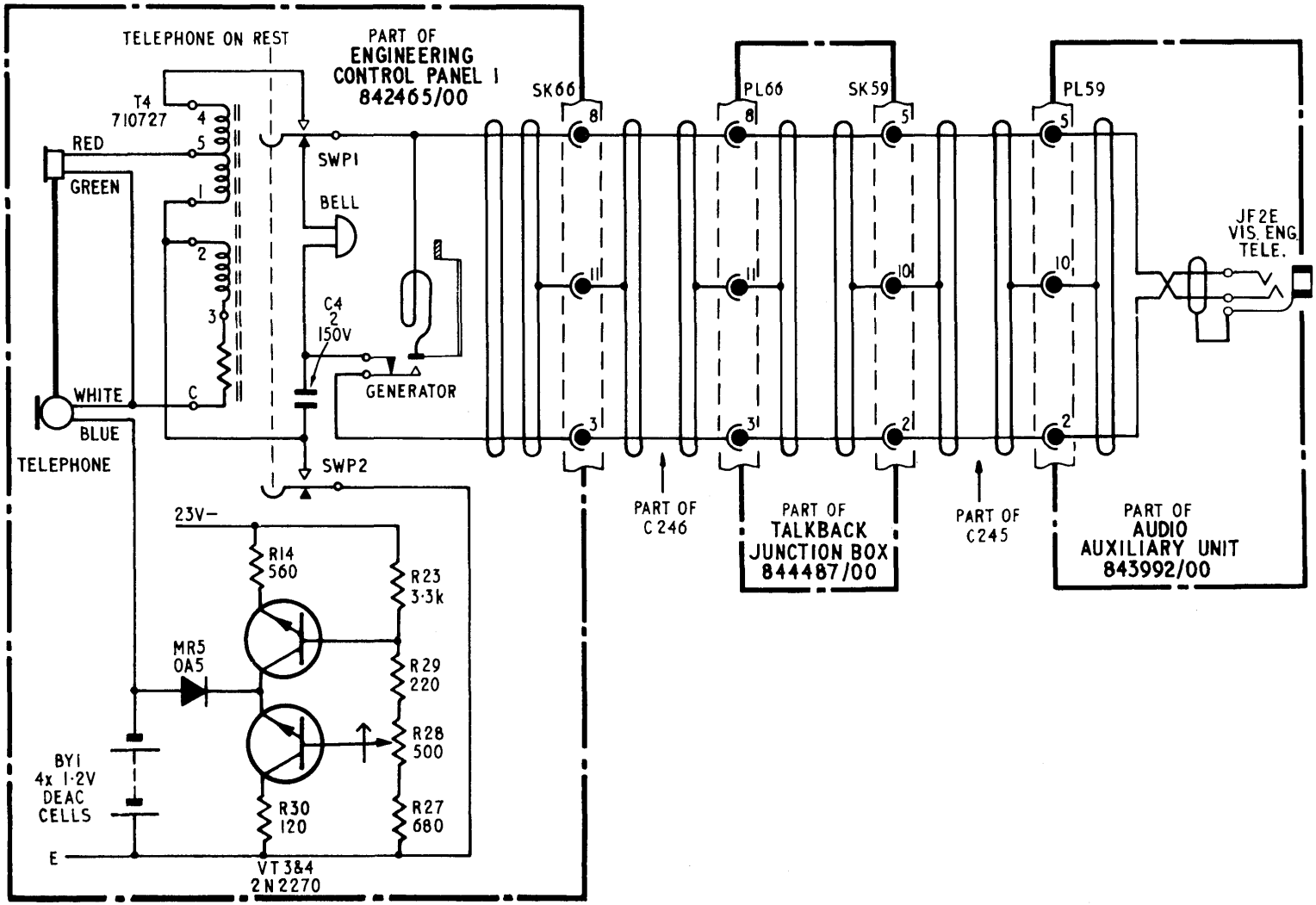
A ringing tone, injected at JF2E on the audio auxiliary unit, will cause the vision engineer's telephone bell to ring. Lifting the handset from its cradle will connect the handset to the telephone lines, mute the bell, and energise the microphone.

The four DEAC cells providing the potential to the handset are maintained at full charge by a supply obtained from a 23V source across R14, R23, and the rectifier MR5.

Side-tone from the handset output is provided by T4.

The hand-operated ringing generator is of the 'make before break' type, and the circuit is so arranged that no pulses are fed to the local telephone bell when the ringing generator is operated.

The output from the handset is fed via the talkback junction box to the audio auxiliary unit, and is available at JF2E.



VISION ENGINEER 1 TELEPHONE CIRCUIT

DTP2720
(Issue 1)

5.4 VISION ENGINEER'S CALLING SYSTEM

Vision Engineer 1 is able to call cameras 1, 2 and Remote, and vision engineer 2 may call cameras 3 and 4, by setting SWA, on the respective engineer's control panel, to the indicated position of the camera required, and moving the CALL/MIC ON switch to CALL.

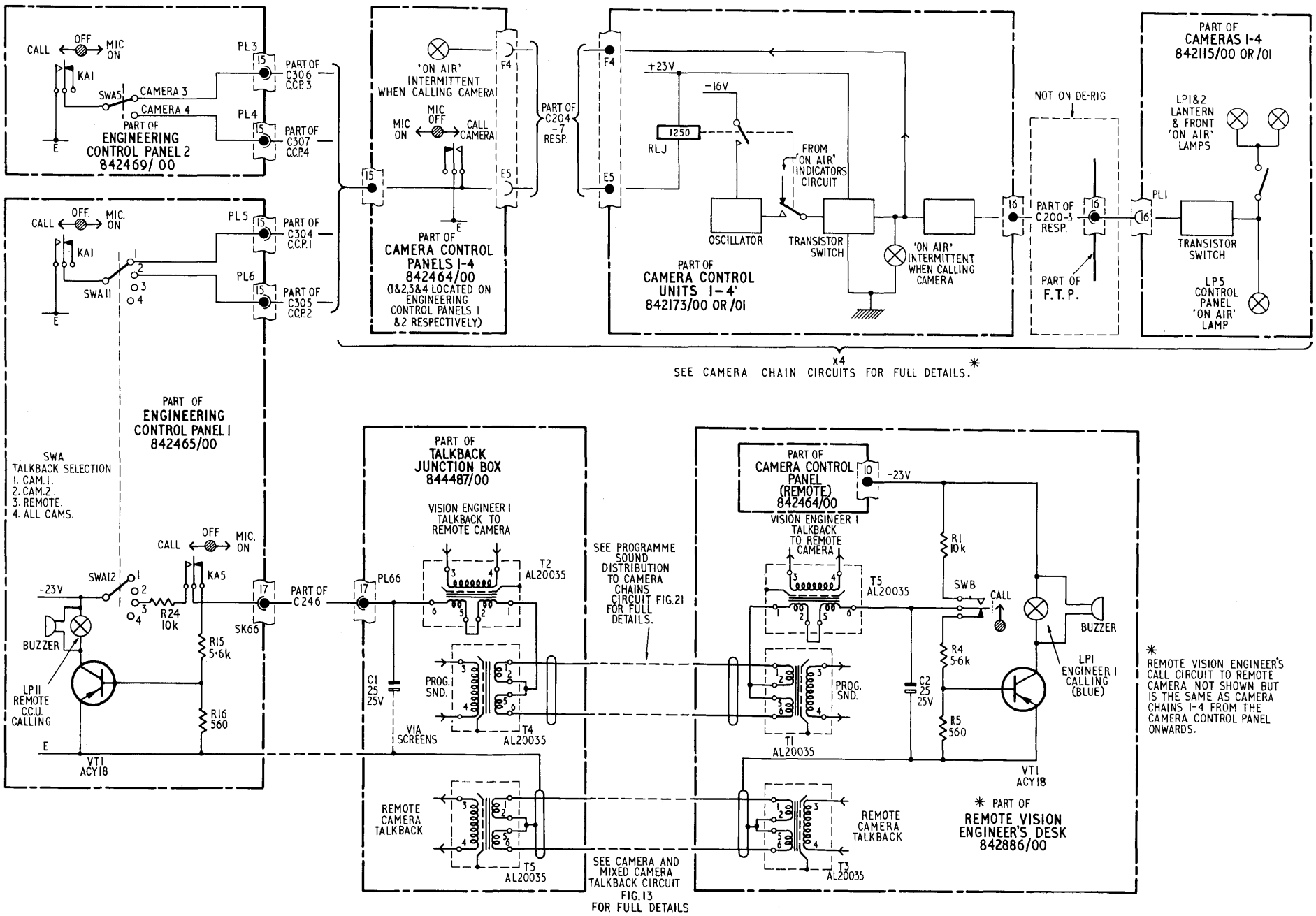
Each camera is also called when the CALL/MIC ON switch, on the camera control panel of the camera required, is set to CALL.

In all cases the signal passes through the camera control panel, is routed via E5 in the camera control unit, and energises RLJ. This relay in turn energises a very low frequency square-wave oscillator. The output of the oscillator is used as an ON/OFF switch waveform which drives the camera ON AIR switch circuits, the method used being substituted for the normal switching from the vision mixing unit.

Vision engineer 1 may call the remote vision engineer by setting SWA to REMOTE, and moving the CALL/MIC ON switch to CALL. A 23V potential is applied via T2 in the talkback junction box, centre-tapped into T4, and "phantommed" on the PROGRAMME SOUND lines to T1 in the remote vision engineer's desk, then transferred to T5. When SWB (CALL), on the remote vision engineer's desk, is in the normal position the signal is taken from T5 and applied to the base of VT1, the transistor starts to conduct, and causes the buzzer to sound and the engineer 1 CAM CALL lamp to light.

The remote vision engineer may call vision engineer 1 by setting the CALL switch (SWB) on his desk to CALL. The CALL signal will travel, in reverse, the path described for the CALL signal from vision engineer 1, and will cause VT1 in the vision engineer 1 desk to conduct, the buzzer to sound, and the REMOTE C.C.U. CALLING lamp to light.

The remote vision engineer may call the remote camera by setting the CALL/MIC ON switch on the camera control panel to CALL, the operation being as described for cameras 1 to 4.



VISION ENGINEER'S CALLING CIRCUIT

DTP2721
(Issue 1)

5.5 'ON AIR' INDICATORS

The 'ON AIR' lamps in the camera chain, the monitor indicator unit, and each camera picture monitor are energised by a 24V d. c. supply.

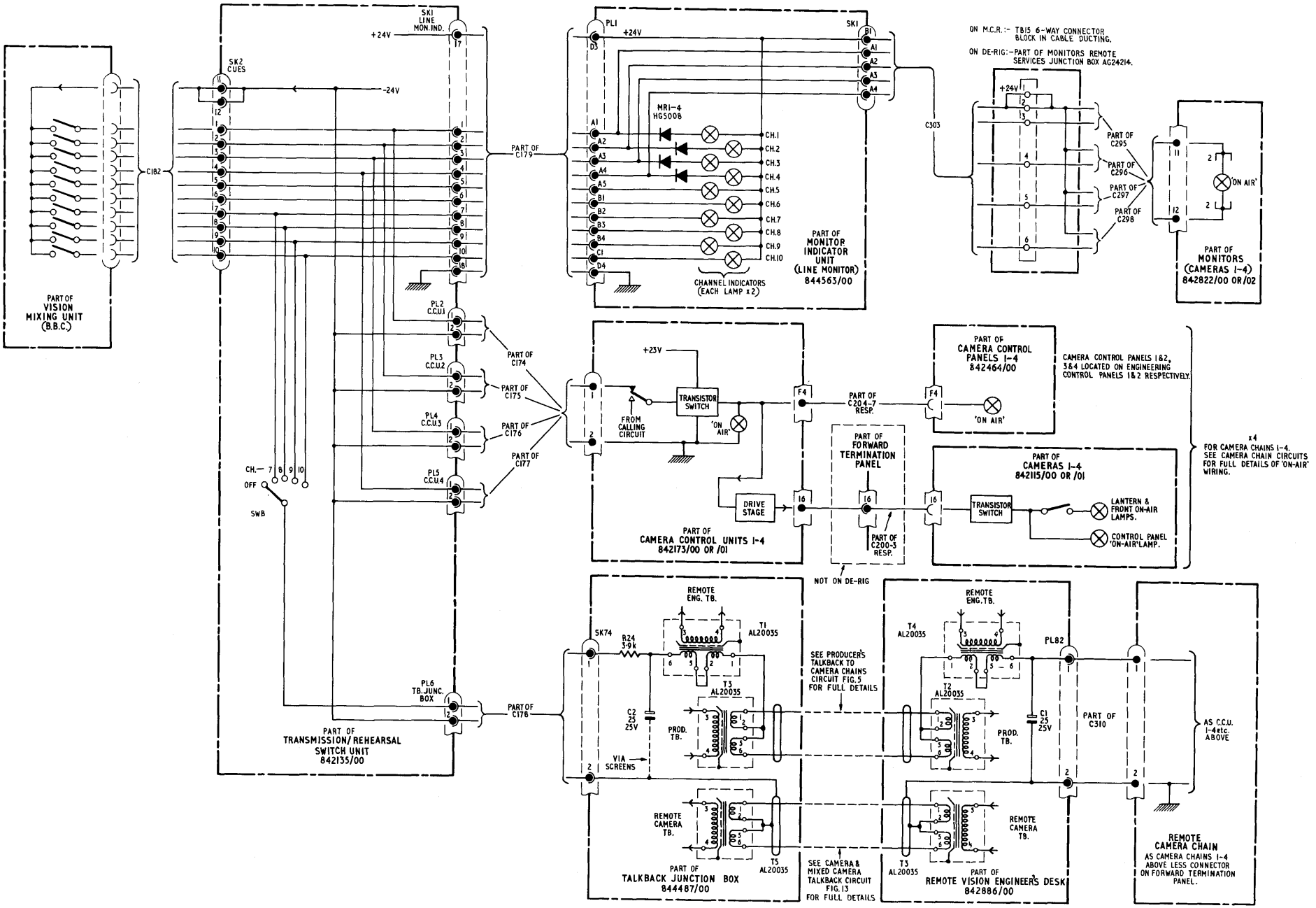
The negative side of the d. c. supply is earthed through the camera chain.

The +24V supply is applied to the terminals on one side of the ON AIR lamps in the monitor indicator unit and the camera picture monitor. The terminals on the other side of the indicator lamps are connected, via the transmission/rehearsal switch unit, to the channel micro-switches in the vision mixing unit, and the transistor switches in the camera control units.

When a channel on the vision mixing unit is selected and faded-up the micro-switch on that channel is closed and the line is earthed. The ON AIR lamps in the monitor indicator unit and the picture monitor then light-up, and the transistor ON AIR switch in the camera control unit is energised, switching on the supply to the ON AIR lamps in the camera chain.

The negative supply to the ON AIR lamps in the remote camera chain is connected via transformers T1 and T3 in the talkback junction box, and T2 and T4 in the remote vision engineer's desk. The channel from the vision mixing unit is selected by SWB in the transmission/rehearsal switch unit.

When the appropriate channel on the vision mixing unit is faded-up the line is connected to earth, and the ON AIR indicator circuits in the remote camera chain function in a similar manner to those on the local cameras.



'ON-AIR' INDICATORS CIRCUIT

DTP2722
(Issue 1)

SECTION 6 - CAMERA SYSTEMS

6.1 CAMERA AND MIXED-CAMERA TALKBACK

CAMERA TALKBACK

A camera operator is able to speak to the vision engineer by setting the CALL/MIC ON switch on the back of the camera to MIC ON. This will connect his microphone output to T3 in the camera. The signal is then passed to the camera talkback amplifier in the camera control unit.

The output from the amplifier is divided, one branch conveying the camera talkback to the vision engineer, the second branch passing the signal into the talkback junction box for inclusion in the mixed-camera talkback circuits.

The branch to the vision engineer feeds into the camera control panel and is again divided, one division passing the signal via T3 and R94 into the isolation amplifier, the output of the amplifier being available at the headset jacks of the camera control panel.

The other signal route continues into the relative vision engineering control panel and is applied to SWA. From SWA the signal passes via the matching transformer T1 (T3) and the potentiometer R1 (R7) into the mixing amplifier, the output of the amplifier being available at the vision engineer's headset jack.

The vision engineer may speak to the camera operator by first setting SWA to the position relative to the camera required, and setting the CALL/MIC ON switch to MIC ON. The switch in the MIC ON position also energises a relay (RLA, B, C or D, according to the camera selected by SWA) the relay contacts will close and attenuate the signal to the producer's mixed-camera talkback circuits, full volume still being available for camera talkback.

REMOTE CAMERA TALKBACK

Talkback from the remote camera operator to the remote vision engineer is as described for local camera talkback.

MIXED-CAMERA TALKBACK

The branch conveying talkback from the camera control unit to the mixed-camera talkback circuits is via the attenuator in the talkback junction box, the amount of attenuation applied to the signal being determined by the position of the relay contacts.

The attenuated signal is then passed to the common M. C. T. B. LEVEL control formed by R25(a) and R25(b), and fed to the mixed-camera talkback amplifier in the audio mixing unit, being routed via the audio auxiliary unit. R25 is provided to enable the volume of talkback at the cameras to be adjusted to the same level as talkback from the remote vision engineer and the remote camera.

Before the input to the amplifier, mixed-camera talkback is available at JK13A, on the audio mixing unit, for connection to a loud-speaker.

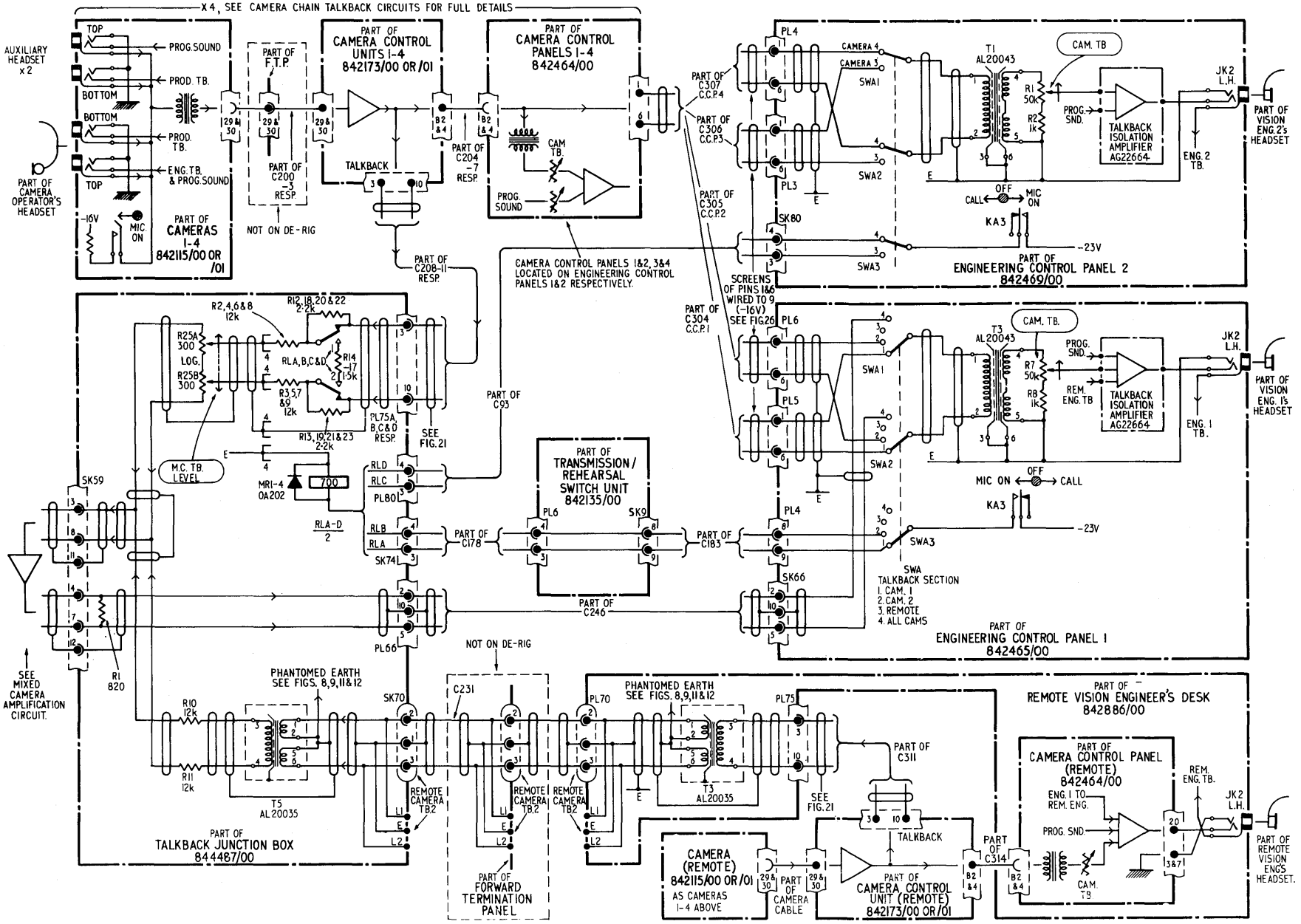
The output from the mixed-cameras talkback amplifier is divided. One branch is returned via the talkback junction box and connected to position 4 of SWA on vision engineer 1 desk, and is made available at the vision engineer's headset when talking to all cameras.

The other branch feeds the producer's, the producer's secretary's, and the senior television engineer's headsets.

The inputs and outputs of the mixed-camera talkback distribution amplifier are made available at the forward termination panel for interconnection with other mobile control units.

REMOTE MIXED-CAMERA TALKBACK

Remote mixed-camera talkback leaves the camera control unit and is conducted via T3 (remote engineer's desk) and the forward termination panel, to T5 in the talkback junction box. From T5 it then joins the common input to the mixed-camera talkback amplifier in the audio mixing unit.



CAMERA & MIXED CAMERA TALKBACK CIRCUIT

DTP2723
(Issue 1)

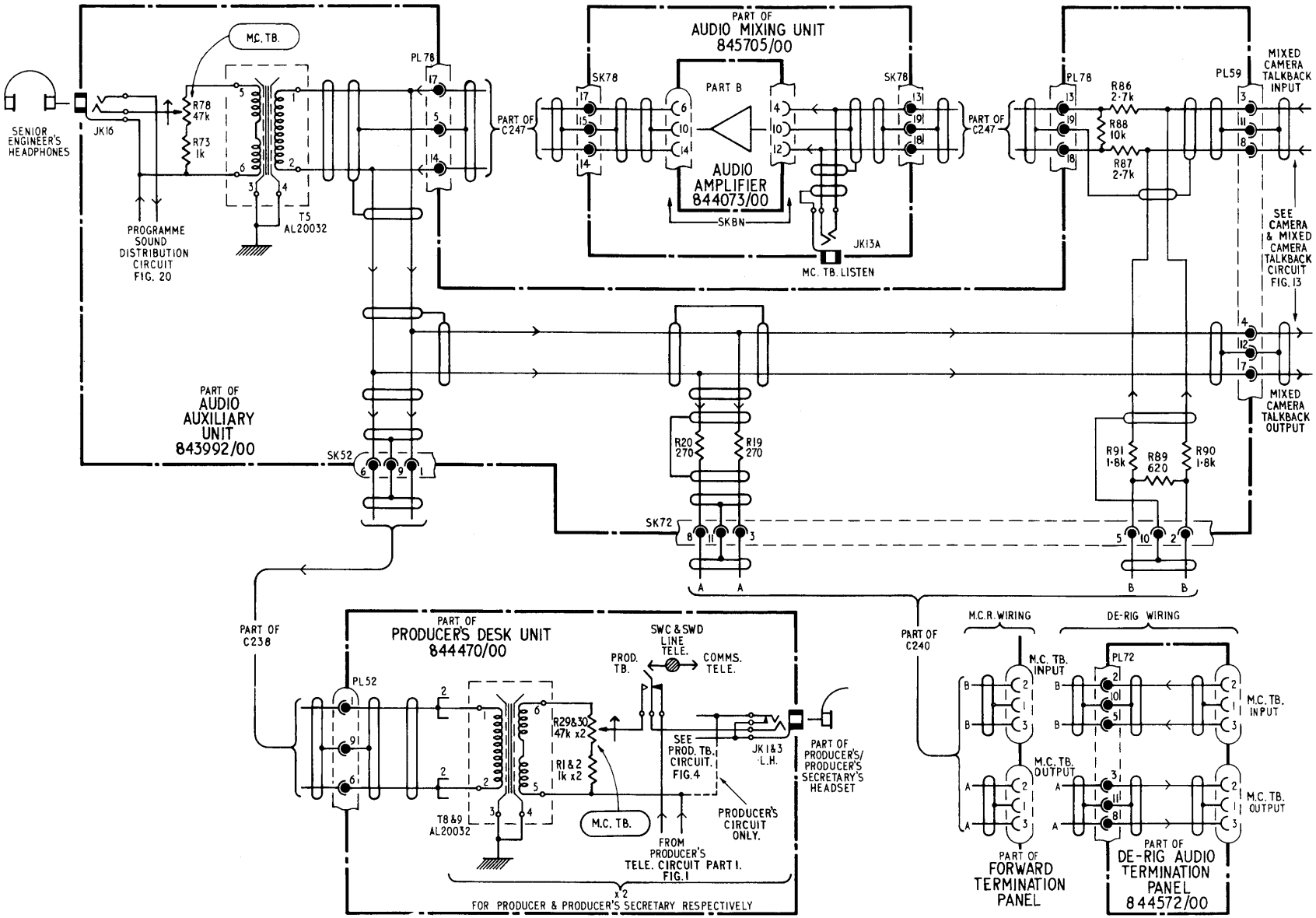
6.2 MIXED-CAMERA TALKBACK AMPLIFICATION

Mixed-camera talkback is routed, via an output on the talkback junction box, to the audio auxiliary unit where the route is joined by an input from the forward termination panel. The signal is then conveyed to the mixed camera talkback amplifier in the audio mixing unit where it is available at a monitoring jack JF13A. The output of the amplifier is also returned to the audio auxiliary unit from where an output is taken to the forward termination panel.

The signal path divides, one path continuing to the senior engineer's headphones, the other path again dividing to feed mixed-camera talkback to the producer's and producer's secretary's headphones. The signal is available at the appropriate headphones when SWC (producer) or SWD (secretary) is set to PROD. TB.

A further signal from the mixed-camera talkback amplifier is routed to the talkback junction box, talkback being fed to vision engineer 1.

Suitable attenuation is provided in the leads from the mixed-camera talkback distribution amplifier to the forward termination panel to enable direct connection to be made to other mobile control rooms.



MIXED CAMERA TALKBACK AMPLIFICATION CIRCUIT

DTP2724
(Issue 1)

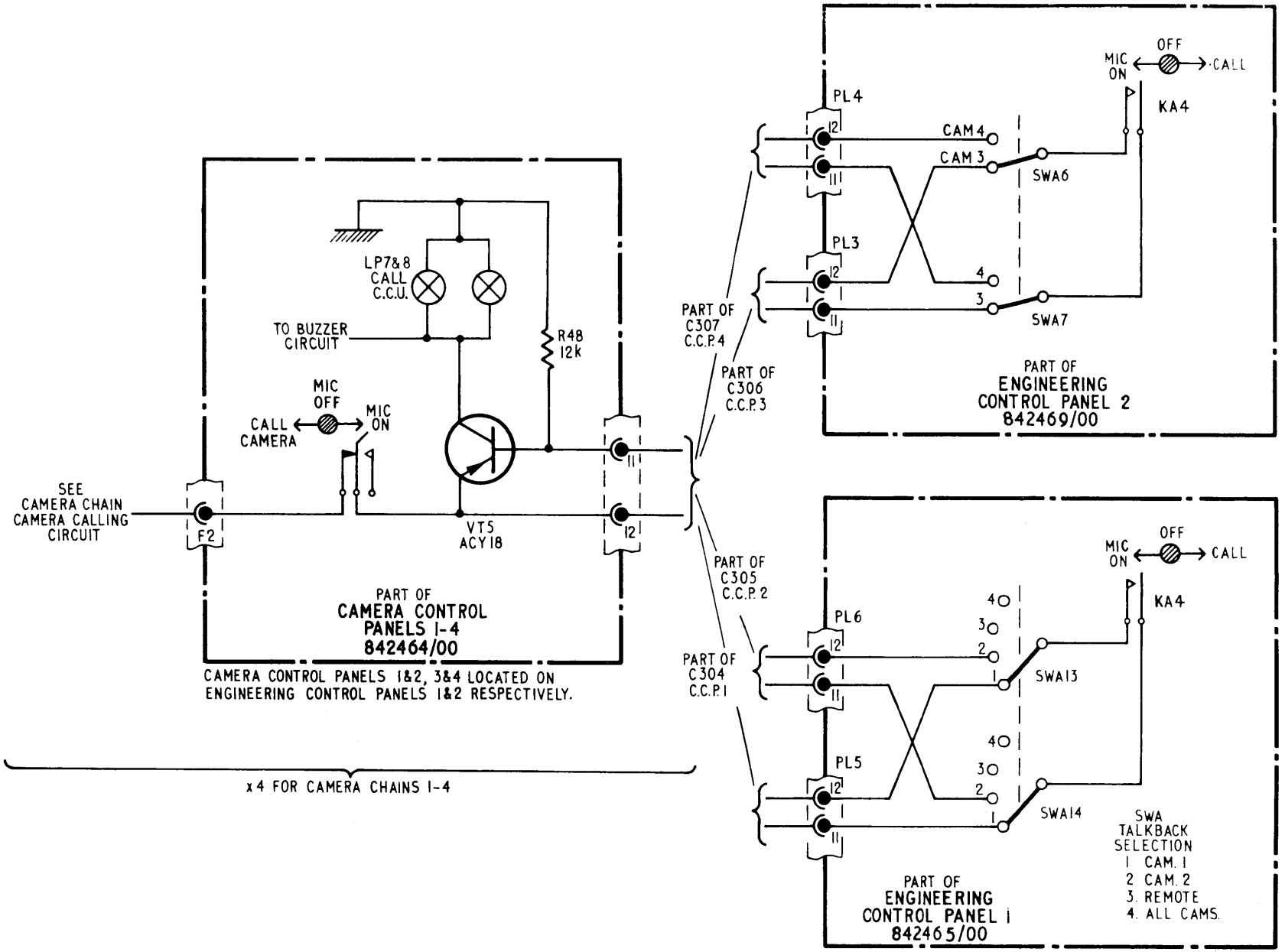
6.3 EXTENDED CAMERA CALL CANCELLING CIRCUIT

The camera operator will call the vision engineer by setting the CALL/MIC ON switch on the camera to CALL.

The CALL signal is then conveyed along the camera cable to the camera control unit and applied to VT76 and VT77. This self-latching network energises the CAM CALL lamps and buzzer in the engineer's control panel via VT5, the transistor being held in conduction by the action of R48.

When the engineer places his CALL/MIC ON switch to MIC ON the circuit current is interrupted and the circuit released.

When the CALL/MIC ON switch on one of the 'extended' desks is set to MIC ON the base of VT5 is short circuited to the emitter, the collector current is then reduced to zero and the circuit released.



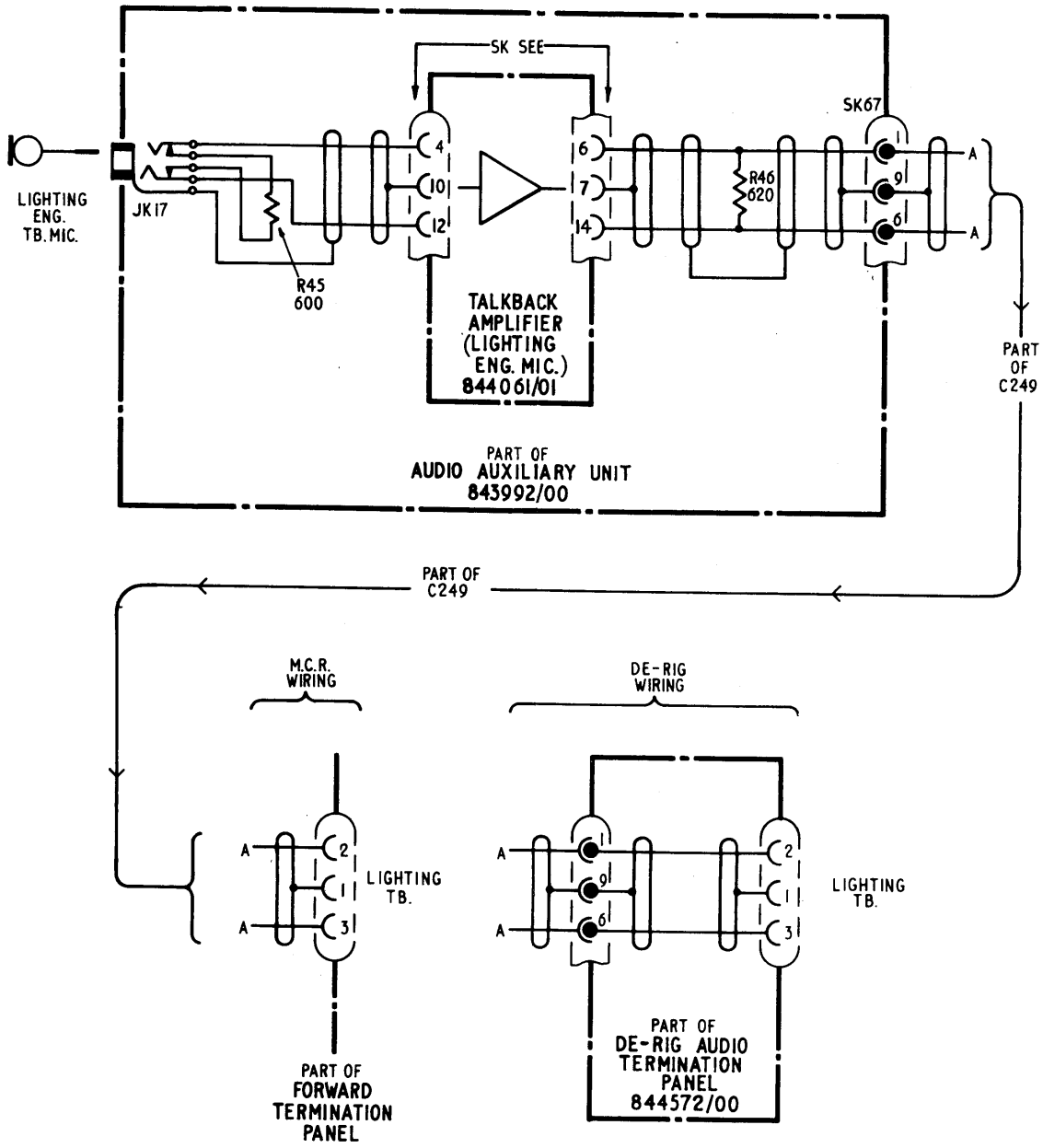
EXTENDED CAMERA CALL CANCELLING CIRCUIT

DTP2725
(Issue 1)

SECTION 7 - LIGHTING ENGINEER'S TALKBACK

JK17 is located on the left hand side of the audio auxiliary unit and is connected to the input of the lighting engineer's talkback amplifier. When the lighting engineer's microphone is plugged into the jack the 600-ohm termination is disconnected, the microphone output signal is routed via the amplifier and becomes available at the forward termination panel for connection as required.

The microphone provided for the use of the lighting engineer has a built-in on/off switch.



LIGHTING ENGINEER'S TALKBACK CIRCUIT

DTP2726
(Issue 1)

SECTION 8 - COMMENTATOR'S HEADPHONES AND CALLING SYSTEMS

SWM (COMMENTATOR 1) and SWN (COMMENTATOR 2) are three-position keyswitches. They are labelled PROG SOUND. PROD TB. RADIO.

In the normal (PROD TB) position of the switch producer's talkback is passed from the audio auxiliary unit, via the ganged potentiometers R34 and R36, to PL52.

Producer's talkback is arranged also to bypass SWM or SWN, and is routed via R33 and R35 to PL52, the arrangement ensuring that producer's talkback is constantly applied to the outputs on PL52 (on the producer's desk) irrespective of the switch positions.

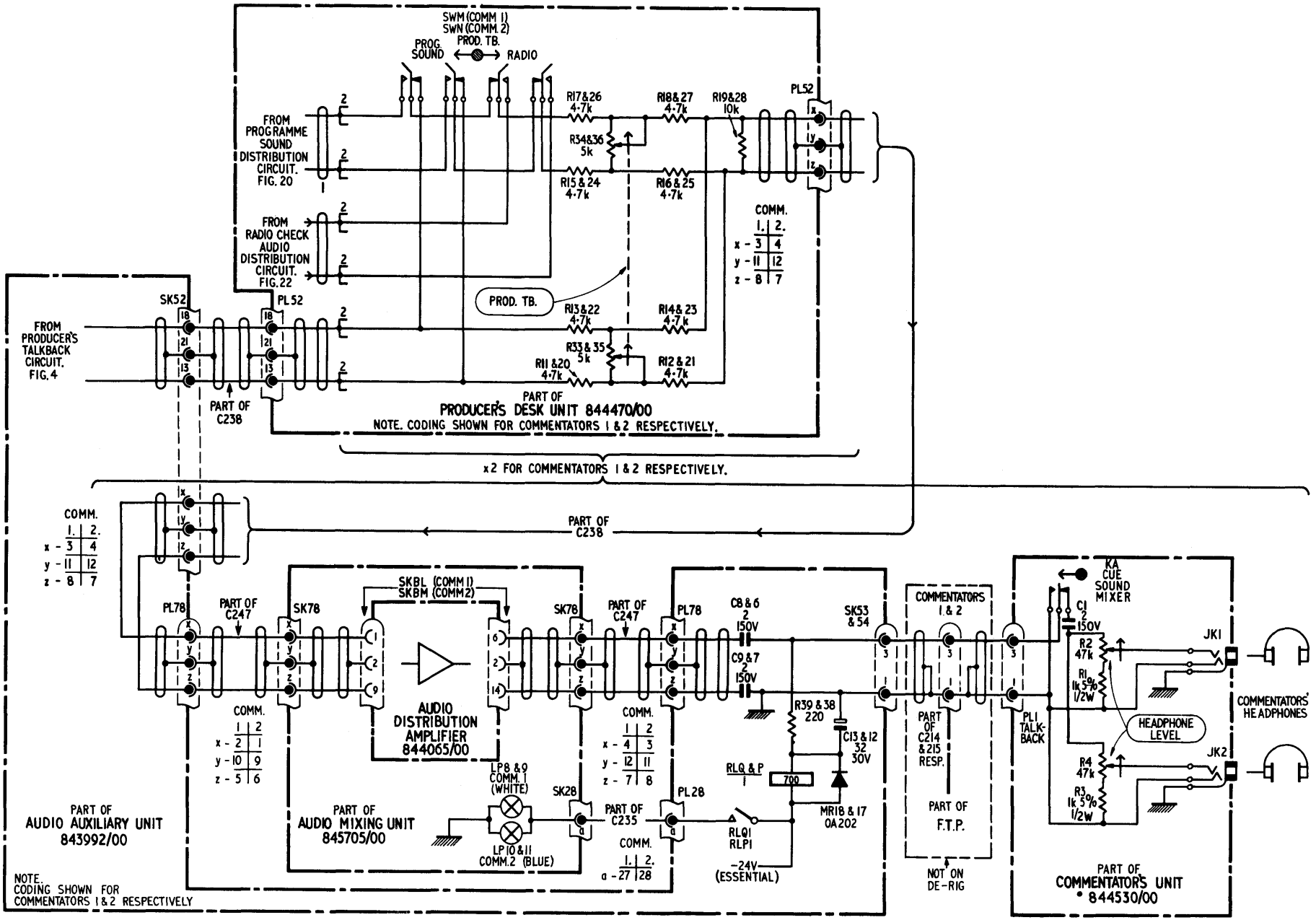
When SWM or SWN is set to PROG SOUND R34 or R35 is connected to the programme sound distribution amplifier. The output on PL52 then receives a mixture of producer's talkback and programme sound, according to the position of the ganged potentiometers (R33 and R34 or R35 and R36). Producer's talkback is at maximum amplitude when the potentiometers are in an anticlockwise position.

With SWM or SWN set to RADIO the transmitted sound signal, from an output of the radio check receiver, is passed to R34 or R35 and mixed as described for producer's talkback and programme sound.

The selected signal from SWM or SWN is then connected, via the audio auxiliary unit, to the appropriate commentator's amplifier in the audio mixing unit, and routed via the forward termination panel to the commentator's unit. When SWA (CUE SOUND MIXER) on the commentator's unit is set in the normal position the signal is available at both headphone jacks.

When SWA is pushed RLP or RLQ in the audio auxiliary unit is energised and causes the appropriate commentator's lamp on the audio mixing unit to light.

Either commentator may call the producer by operating the keyswitch KA on his unit. Operation of KA will cause RLA or RLB, on the audio auxiliary unit, to become energised and action as described in section 2.2 of this manual to take place.



COMMENTATORS' HEADPHONES & CUE CIRCUIT

DTP2727
(Issue 1)

SECTION 9 - CUE L.S. 1 AND CUE L.S. 2 MUTING

SWG. on the audio auxiliary unit is a five-position switch around which is inscribed the names of five signal sources. When the switch is set to one of these inscriptions the source named is connected to a cue loudspeaker unit (CUE L.S. 1) located outside the mobile control room.

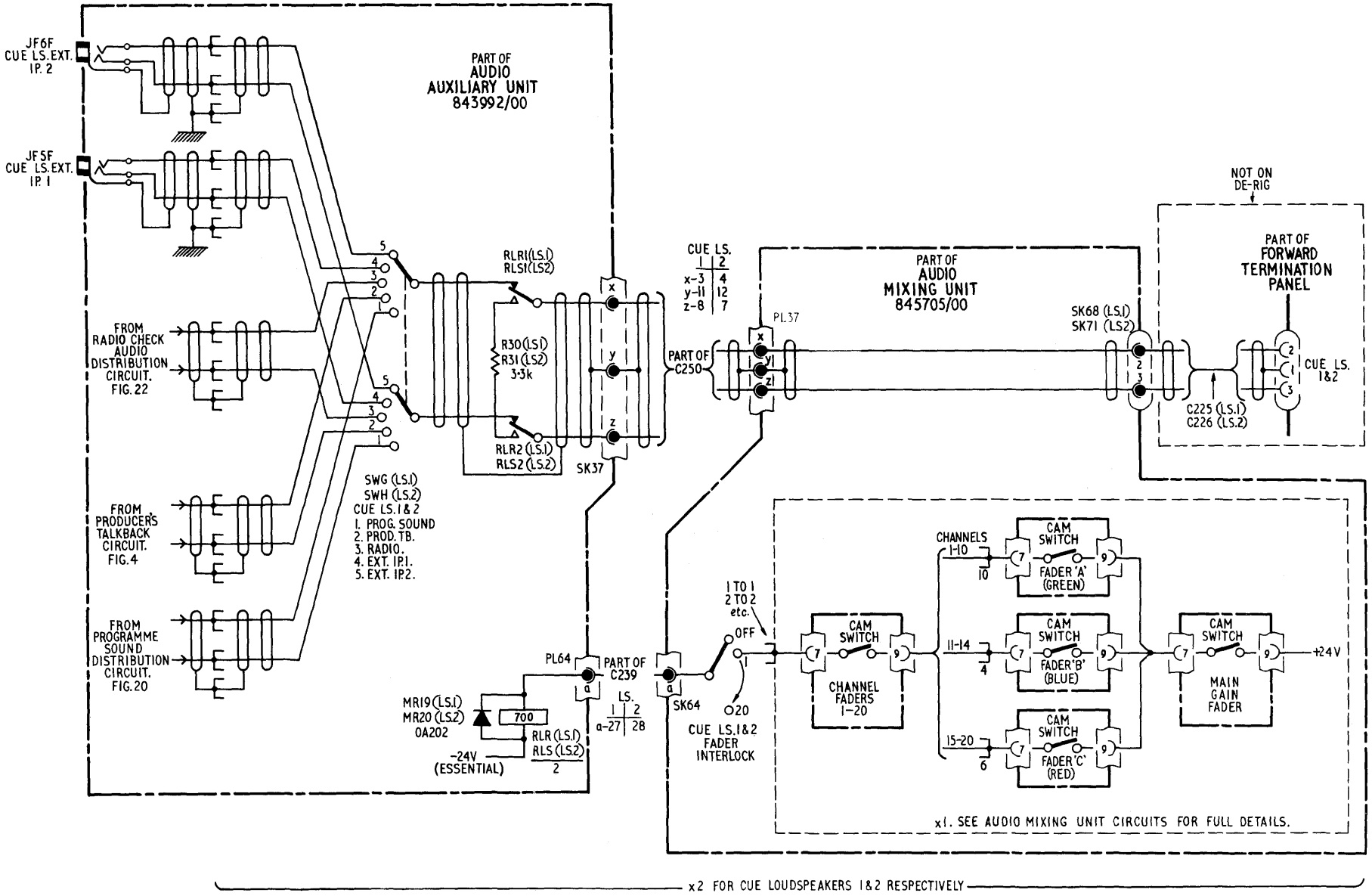
Connection from the audio auxiliary unit to Cue L.S. 1 is made via the output sockets on the audio mixing unit and the forward termination panel.

If a microphone is required to be brought into use near the cue loudspeaker unit the cue loudspeaker is muted when the following conditions exist:-

> the FADER INTERLOCK SELECTOR CUE L.S. 1 on the audio mixing unit is set to the number which indicates the channel to be faded-up, the MAIN GAIN fader and the appropriate GROUP fader are off the bottom stop, and the appropriate CHANNEL fader is faded-up.

Fading-up of the channel fader operates a cam switch which causes RLR to become energised. RLR 1-2 will open and cause the line from SWG to be broken and CUE L.S. 1 to be muted.

SWH on the audio auxiliary unit is connected to CUE L.S.2 via the FADER INTERLOCK SELECTOR CUE L.S.2 on the audio mixing unit. It functions in a similar manner to SWG causing RLS to operate and CUE L.S.2 to be muted.



CUE LOUDSPEAKERS 1 & 2 INTERLOCK CIRCUIT

DTP2728
(Issue 1)

SECTION 10 - MONITOR LOUDSPEAKER INPUT

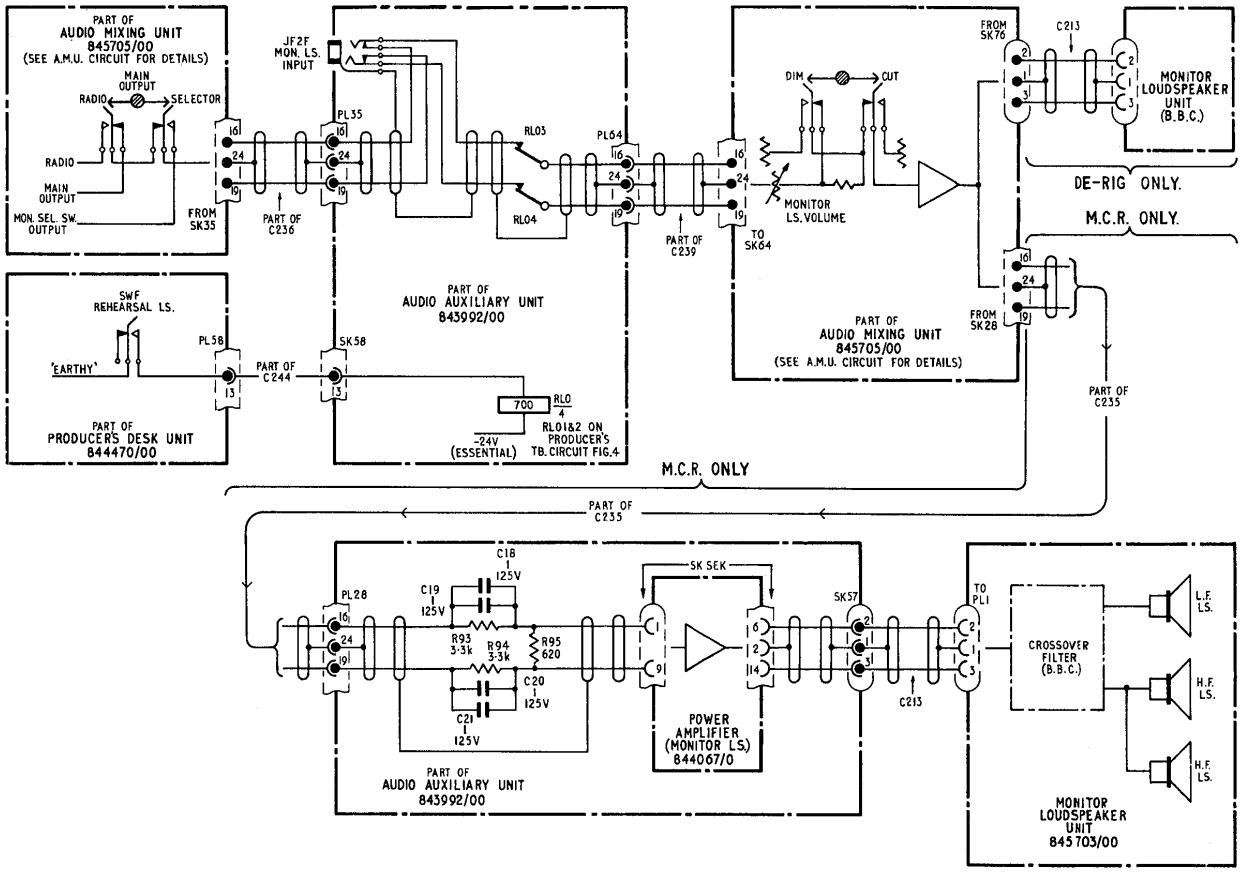
The monitor key switch on the audio mixing unit is a three-position switch labelled RADIO, MAIN OUTPUT, SELECTOR. The switch will present signals, according to its setting, from any one of these sources into the monitor loudspeaker circuit.

The signals are routed through the audio auxiliary unit, a breakjack (JF2F) in this unit providing an additional input for monitoring purposes. With RLO in the de-energised position contacts 3 and 4 route the circuit back into the audio mixing unit. In the audio mixing unit a compensated, 10-step attenuator, the MON L.S. volume control, provides a zero to 20dB attenuation of the signal. Alternatively, variations in signal strength are obtained by operation of the monitor loudspeaker DIM/CUT switch. The normal position of the switch passes the signal without attenuation, the DIM position gives an attenuation of 12dB and the CUT position mutes the loudspeaker and inserts a damping resistor across the input of the monitor loudspeaker drive amplifier. The front (A) half only of this amplifier is used to drive the monitor loudspeaker, the gain of this half is continuously variable over 25dB, the variation being made by operation of the gain control.

The compensated attenuator (MON L.S.) in the audio mixing unit should normally be set to give maximum output.

Two outputs for the signal are provided; one output routes the signal to the monitor loudspeaker amplifier via a frequency compensating network which corrects for the acoustic characteristics of the van interior, and the second output leads through the audio auxiliary unit from which it can be connected to an external loudspeaker unit.

When SWF (REHEARSAL L.S.) on the producer's desk is operated RLO is energised, RLO 1-2 open, and the monitor loudspeaker is then muted.



MONITOR LOUDSPEAKER INPUT CIRCUIT

SECTION 11 - PROGRAMME SOUND SYSTEMS

11.1 PROGRAMME SOUND DISTRIBUTION

Programme sound is derived from the output of the main amplifier in the audio mixing unit. It is distributed by the back (B) half of the monitor loudspeaker drive amplifier, and is available at JF20A on the audio mixing unit for connection to the sound engineer's headphones, also being routed via SK28 to the audio auxiliary unit.

In the audio auxiliary unit the path is resistively split to provide three outputs on the forward termination panel, one being a Eurovision link, the other two for use as required.

Further branches in the audio auxiliary unit make programme sound available as follows:

(a) at JF8E.

(b) Cue L.S.1 and Cue L.S.2 circuits

(c) via SWE to the camera chain circuits

(d) via SWL to the senior engineer's headphones

(e) via SK49 to the producer's desk.

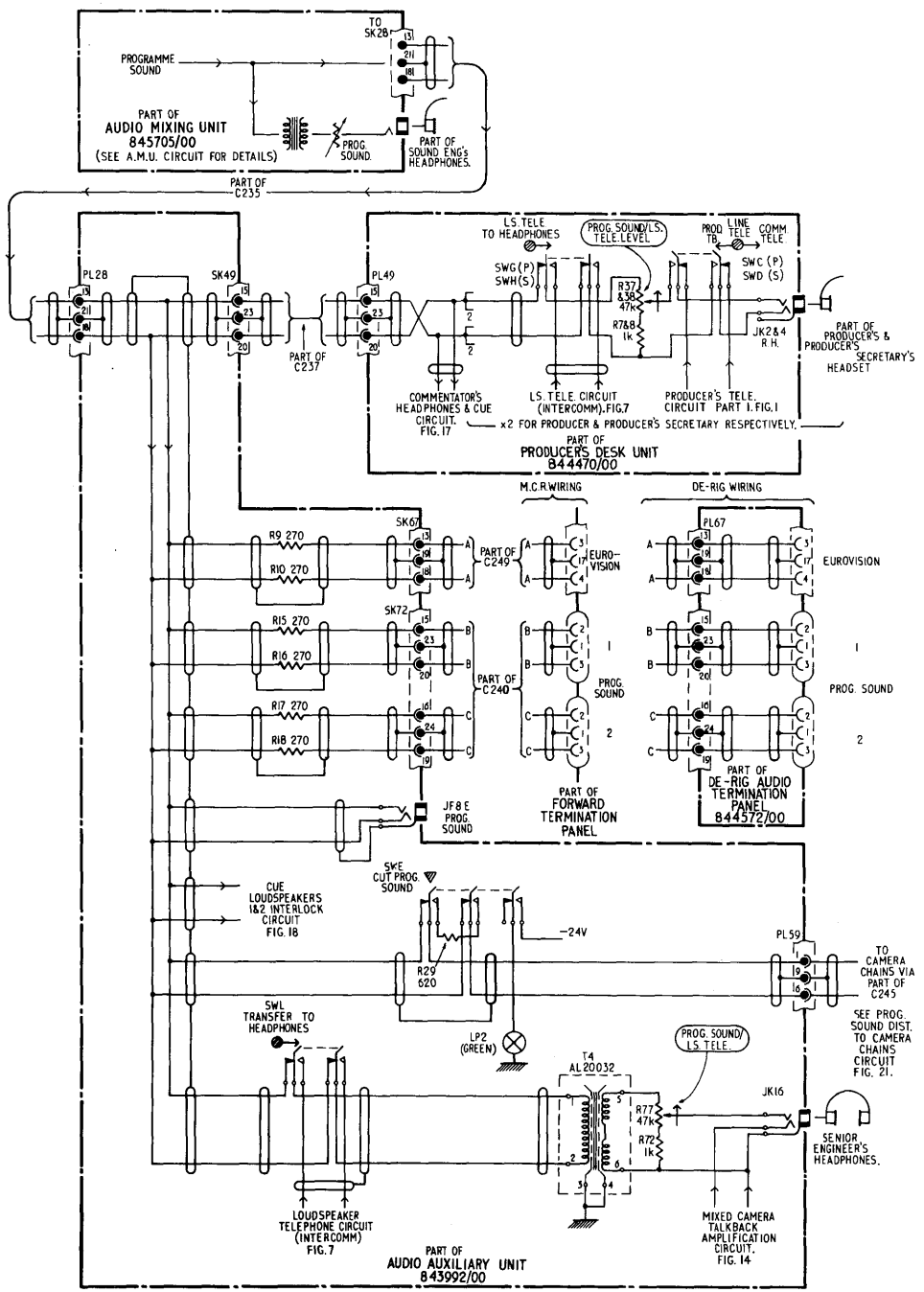
The normal position of SWE routes programme sound to the camera chain circuits, when SWE is set to CUT programme sound is fed into the dummy load (R29) and LP2 is lighted to indicate that programme sound is not available to the camera circuits.

The normal position of SWL routes programme sound via the matching transformer T4 and the volume control R77 to JK16 where it is available for the senior engineer's use.

Programme sound to the producer's desk via SK49 is branched in the producer's desk to the commentator's circuits, and is then routed to SWG (producer's L.S. TELE TO HEADPHONES) and SWH (secretary's L.S. TELE TO HEADPHONES). The normal position of either of these switches will cause programme sound to be available via a volume control to SWC or SWD.

When SWC is set to PROD TB and SWD is in the normal position programme sound is fed to the producer's right earpiece.

When SWD is set to PROD TB and SWC is in the normal position, programme sound is fed to the right earpiece of the producer's secretary.



PROGRAMME SOUND DISTRIBUTION CIRCUIT

DTP2730
(Issue 1)

11.2 PROGRAMME SOUND TO CAMERA CHAINS

With SWE on the audio auxiliary unit set to the normal position programme sound is fed to the talkback junction box. Branches from the talkback junction box pass the signal to the camera control units 1-4, a further branch providing a route to T4 in the talkback junction box. From T4 the signal passes via the forward termination panel to T1 on the remote vision engineer's desk, and is then fed to the remote camera control unit. In this unit alternative routes pass programme sound:

(a) via the isolating transformer T8 directly to T2 on the remote camera for distribution to the various headphone and headset jacks of the remote camera.

(b) to the remote camera control panel, via R91 and the matching transformer T4, into the two-stage isolating amplifier, the output of the amplifier being available at the remote vision engineer's headset jack.

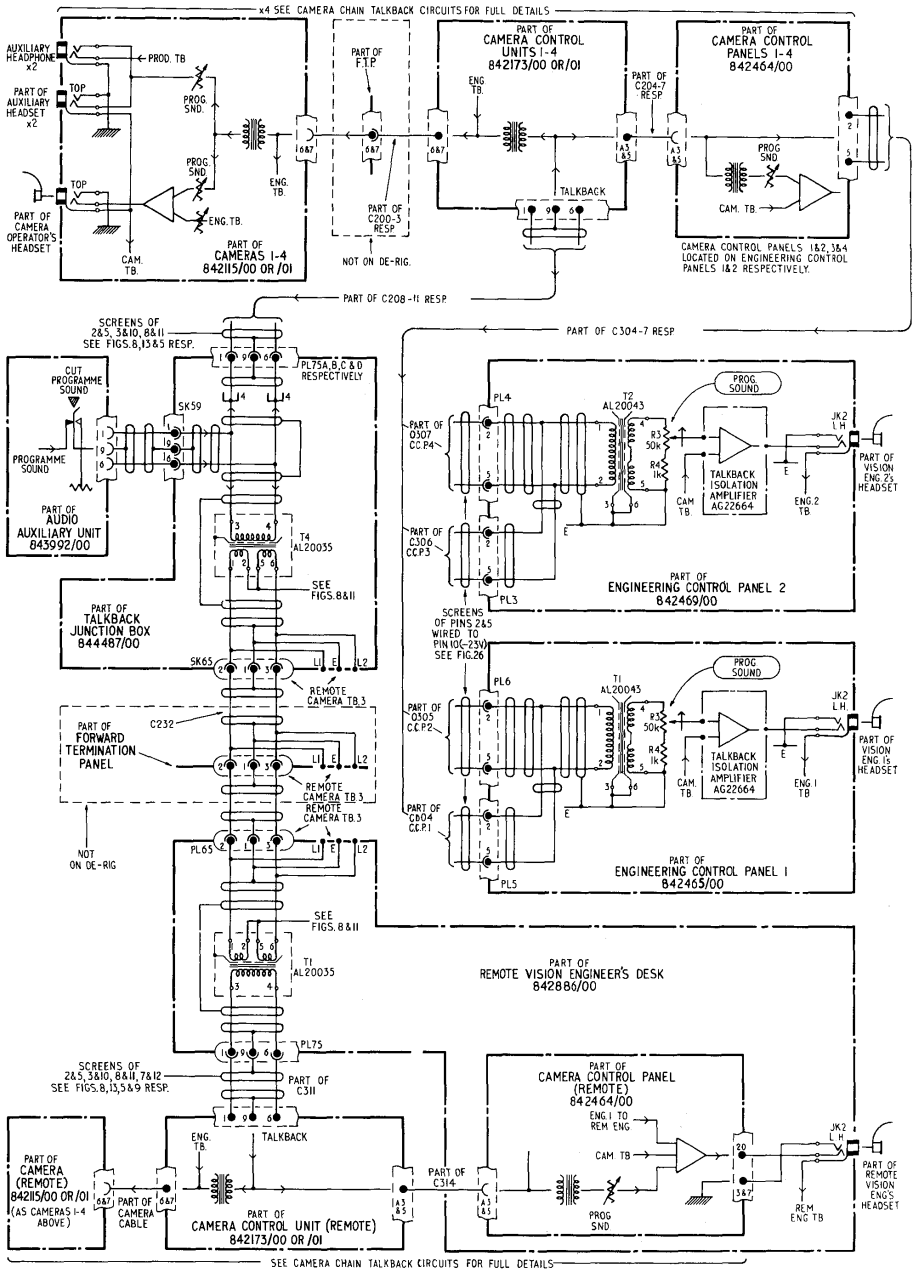
From the talkback junction box a link is provided to the camera control unit of each of the cameras 1 to 4. The signal route divides in the camera control unit and passes programme sound:

(a) to the camera control panel, the signal being available via the isolating amplifier at the headphone jacks.

(b) to the engineering control panels of vision engineers 1 and 2, the signal passing via the relative amplifiers to the appropriate headsets as indicated on the circuit diagram, and

(c) via the forward termination panel to the appropriate camera.

From T2 in the camera, programme sound is fed via the volume control R8 (located on left side of the camera), to the two auxiliary headphone jacks. Programme sound is also passed via R35, the camera operator's volume control (located on the back of the camera) into the isolating transformer, the output of which makes the signal available at the camera operator's headset.



PROGRAMME SOUND DISTRIBUTION TO CAMERA CHAINS CIRCUIT DTP2731 (Issue 1)

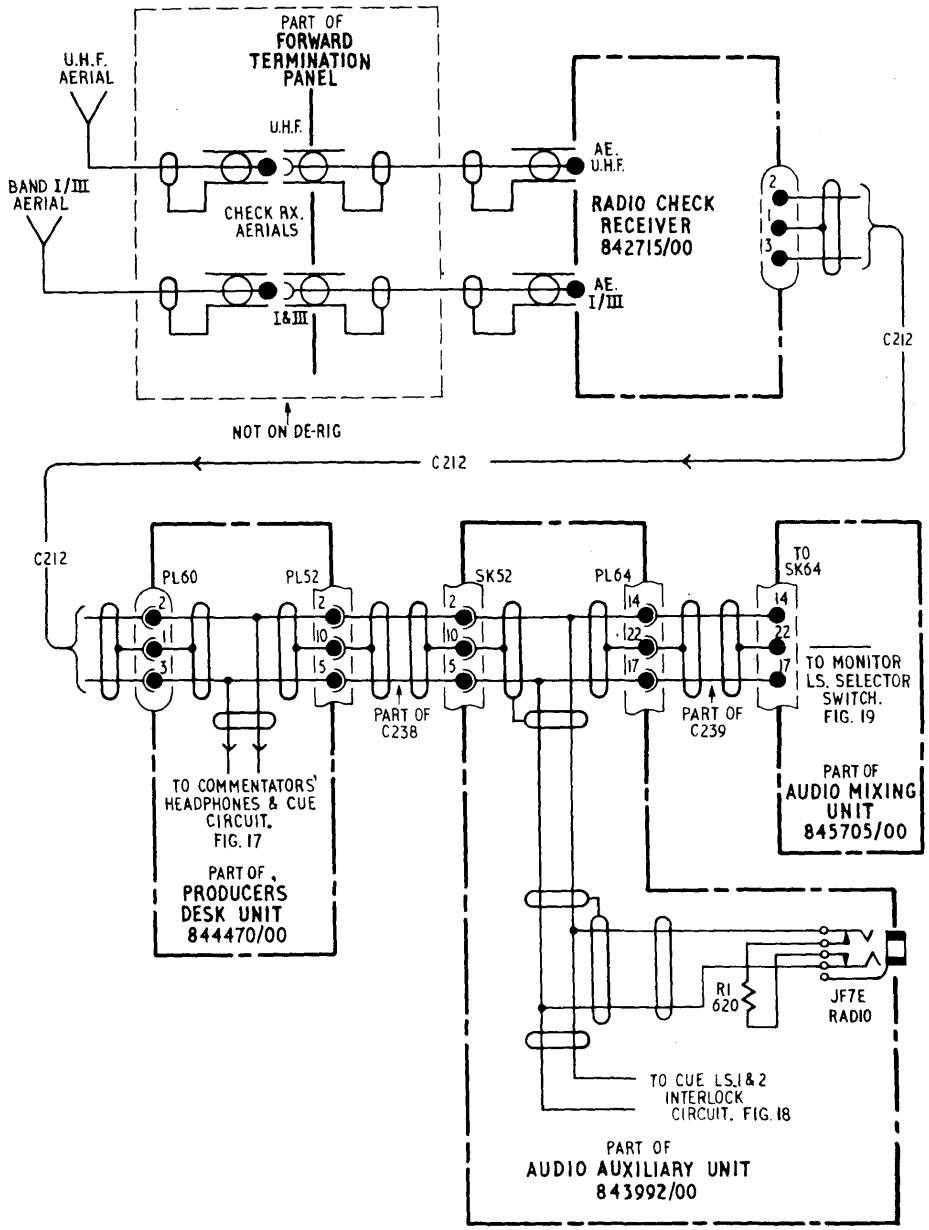
SECTION 12 - RADIO CHECK RECEIVER AUDIO DISTRIBUTION

Signals from the U.H.F. or V.H.F. aerials on the mobile control room are fed to the respective tuner inputs on the radio check receiver via the forward termination panel.

From the radio check receiver three outputs are available, one of which is used to pass the audio signal to the producer's desk where a branch routes the signal to the individual commentator's headphone mixing circuit, another branch passing the signal into the audio auxiliary unit.

In the audio auxiliary unit the line divides and connects the signal to the jackfield at JF7E (RADIO) and also passes the signal into the CUE L.S.1 and CUE L.S.2 circuits.

The distribution of the audio signal continues to the external monitor loudspeaker switch on the audio mixing unit, the 'up' position of the switch making the signal available to the monitor loudspeaker.



RADIO CHECK AUDIO DISTRIBUTION CIRCUIT

DTP2732
(Issue 1)

SECTION 13 - TELEPHONE LINES

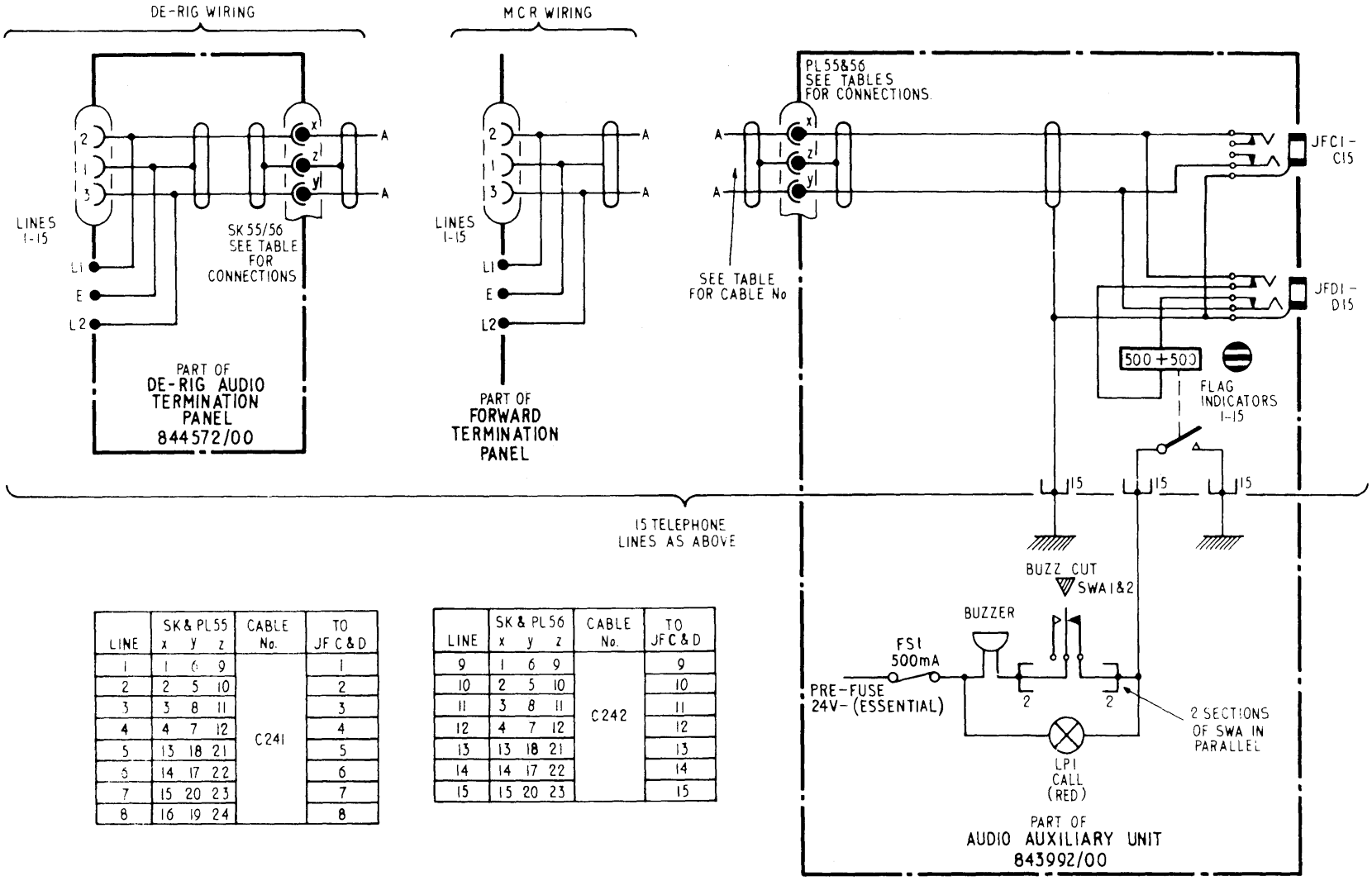
The fifteen telephone lines on the small PBX board, located on the audio auxiliary unit, enter the mobile control room via the forward termination panel.

An incoming ringing tone will energise the relay on a line jack, the drop indicator will be released, the red CALL lamp in the CUT BUZZ button will light, and a buzzer will sound.

Insertion of a plug in the line jack will mute the buzzer, extinguish the red light, and restore the drop indicator.

The buzzer may be separately muted by pushing the CUT BUZZ switch, the red lamp will remain lighted until the call is answered.

Each line jack has a parallel jack directly beneath it.

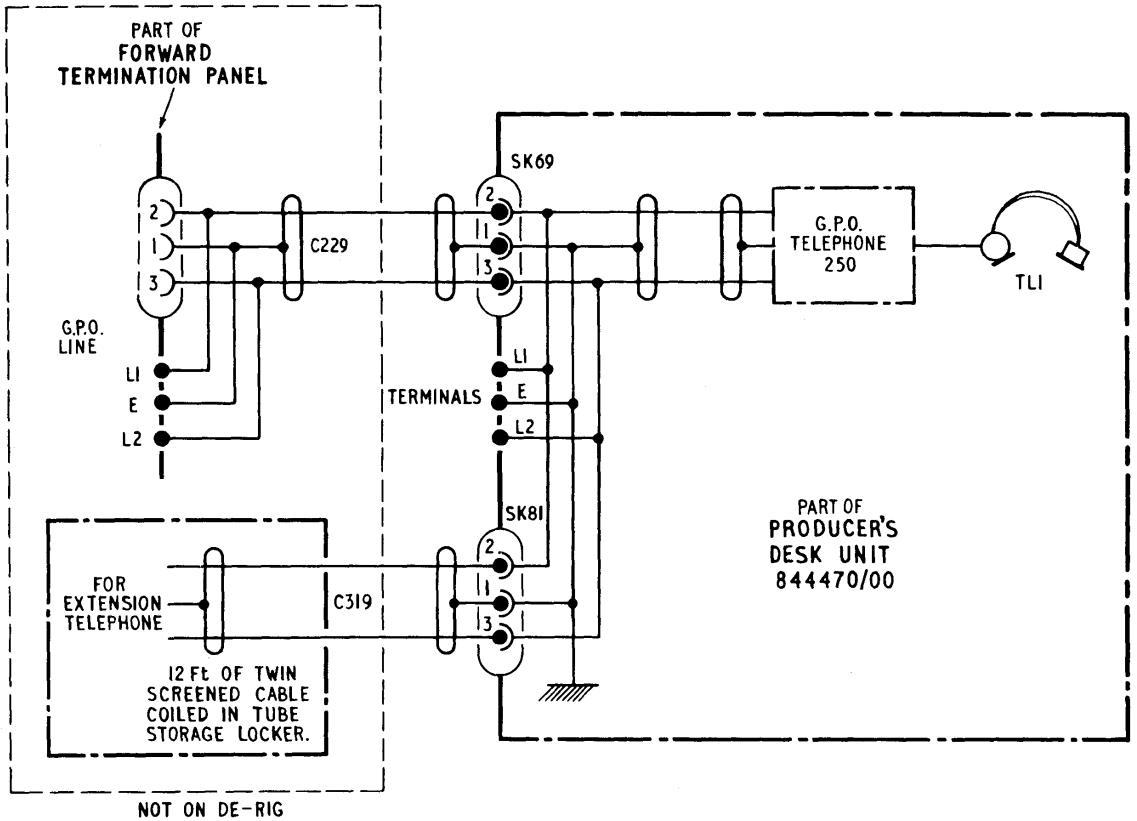


LINE	SK & PL55 x	y	z	CABLE No.	TO JFC & D
1	1	6	9	C241	1
2	2	5	10		2
3	3	8	11		3
4	4	7	12		4
5	13	18	21		5
6	14	17	22		6
7	15	20	23		7
8	16	19	24		8

LINE	SK & PL56 x	y	z	CABLE No.	TO JFC & D
9	1	6	9	C242	9
10	2	5	10		10
11	3	8	11		11
12	4	7	12		12
13	13	18	21		13
14	14	17	22		14
15	15	20	23		15

TELEPHONE LINES CIRCUIT

DTP2733
(Issue 1)



PRODUCER'S G. P. O. TELEPHONE CIRCUIT

DTP2734
(Issue 1)

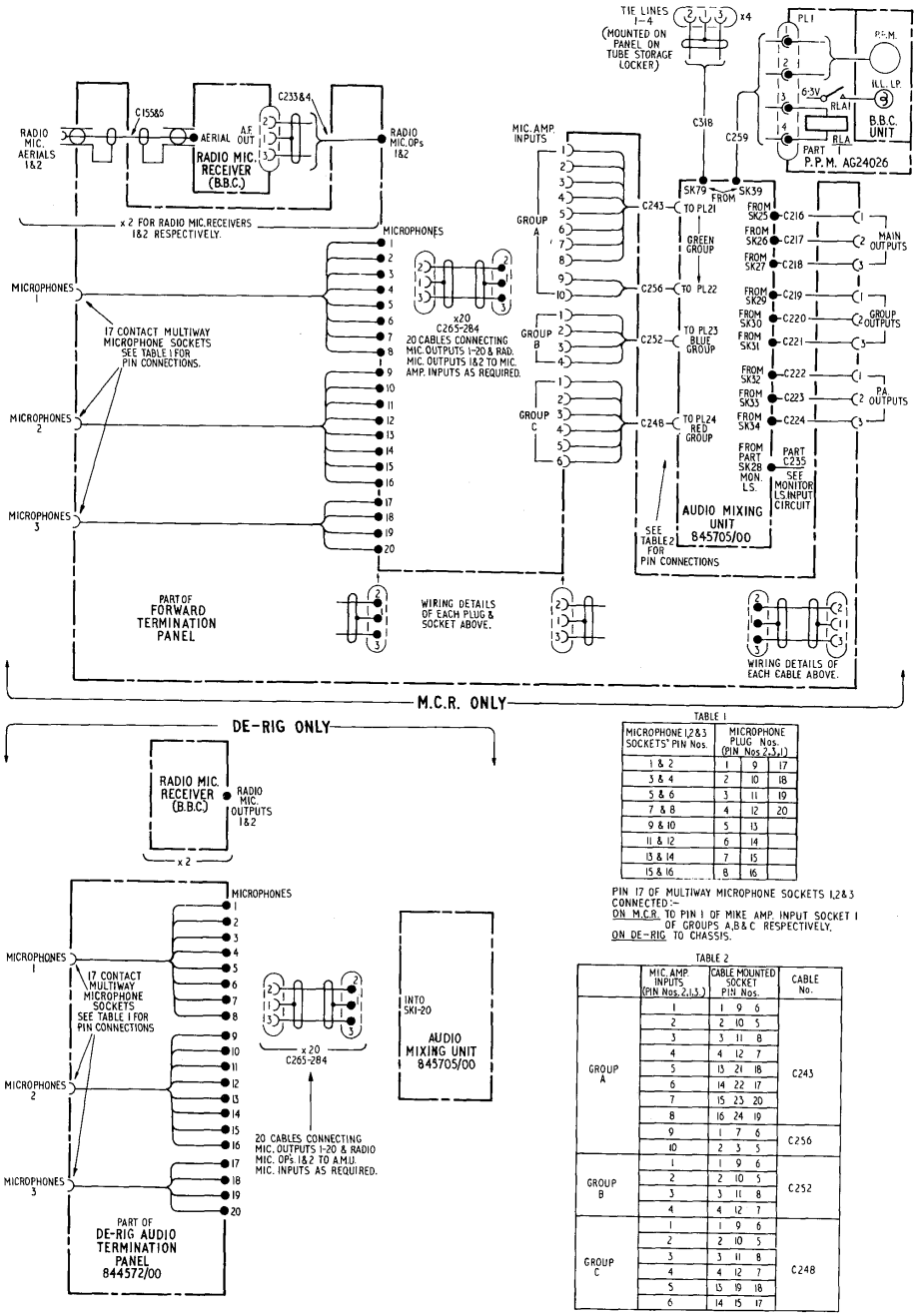


TABLE 1

MICROPHONE 1,2 & 3 SOCKETS' PIN Nos.	MICROPHONE PLUG Nos. (PIN Nos 2,3,1)		
1 & 2	1	9	17
3 & 4	2	10	18
5 & 6	3	11	19
7 & 8	4	12	20
9 & 10	5	13	
11 & 12	6	14	
13 & 14	7	15	
15 & 16	8	16	

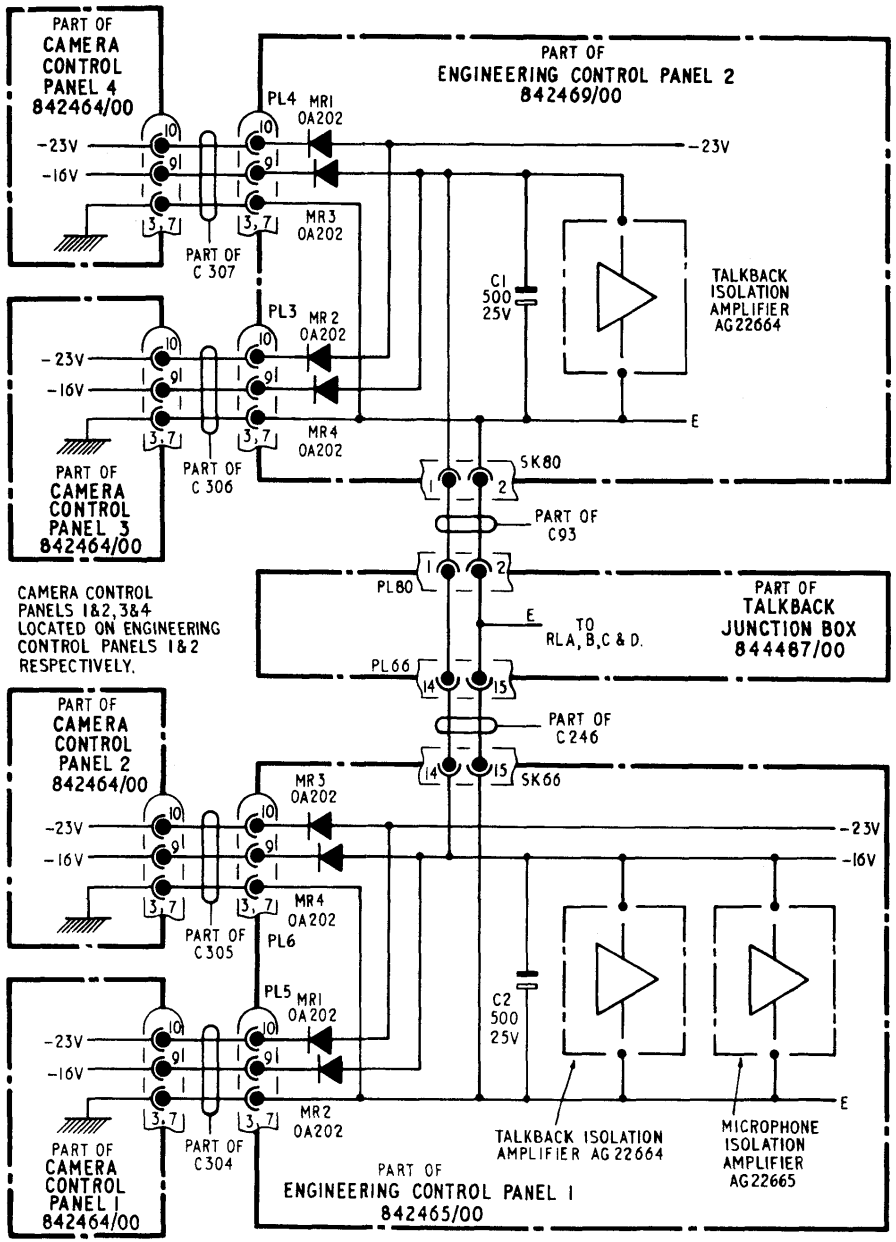
PIN 17 OF MULTIWAY MICROPHONE SOCKETS 1,2&3 CONNECTED:-
ON M.C.R. TO PIN 1 OF MIKE AMP INPUT SOCKET 1 OF GROUPS A,B & C RESPECTIVELY.
ON DE-RIG TO CHASSIS.

TABLE 2

	MIC. AMP. INPUTS (PIN Nos. 2,1,3.)	CABLE MOUNTED SOCKET PIN Nos.	CABLE No.
GROUP A	1	1 9 6	C243
	2	2 10 5	
	3	3 11 8	
	4	4 12 7	
	5	13 21 18	
	6	14 22 17	
	7	15 23 20	
	8	16 24 19	
	9	1 7 6	C256
	10	2 3 5	
GROUP B	1	1 9 6	C252
	2	2 10 5	
	3	3 11 8	
	4	4 12 7	
GROUP C	1	1 9 6	C248
	2	2 10 5	
	3	3 11 8	
	4	4 12 7	
	5	13 19 18	
	6	14 15 17	

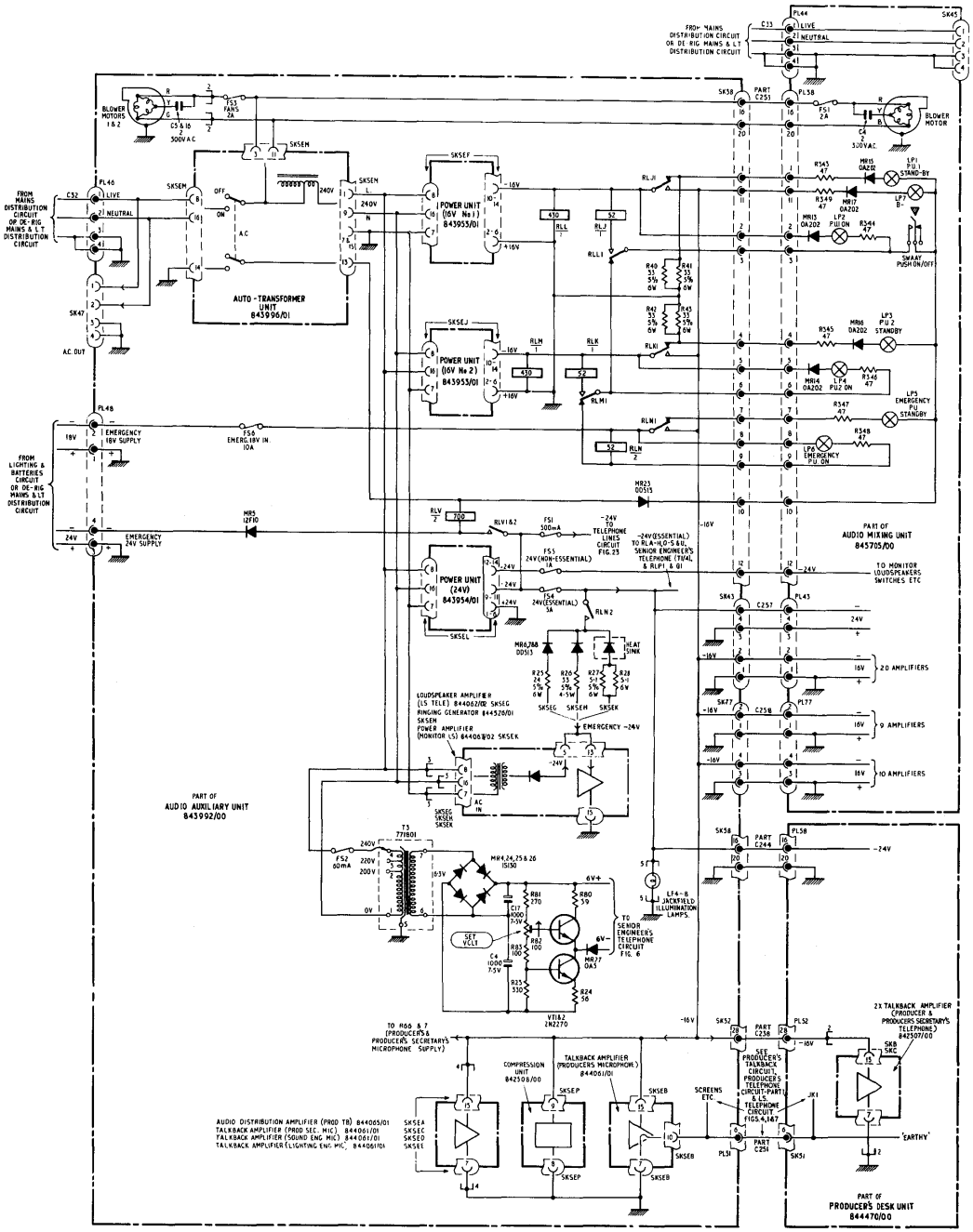
AUDIO MIXER MICROPHONE INPUTS, & OUTPUT CABLES

DTP2735
(Issue 1)



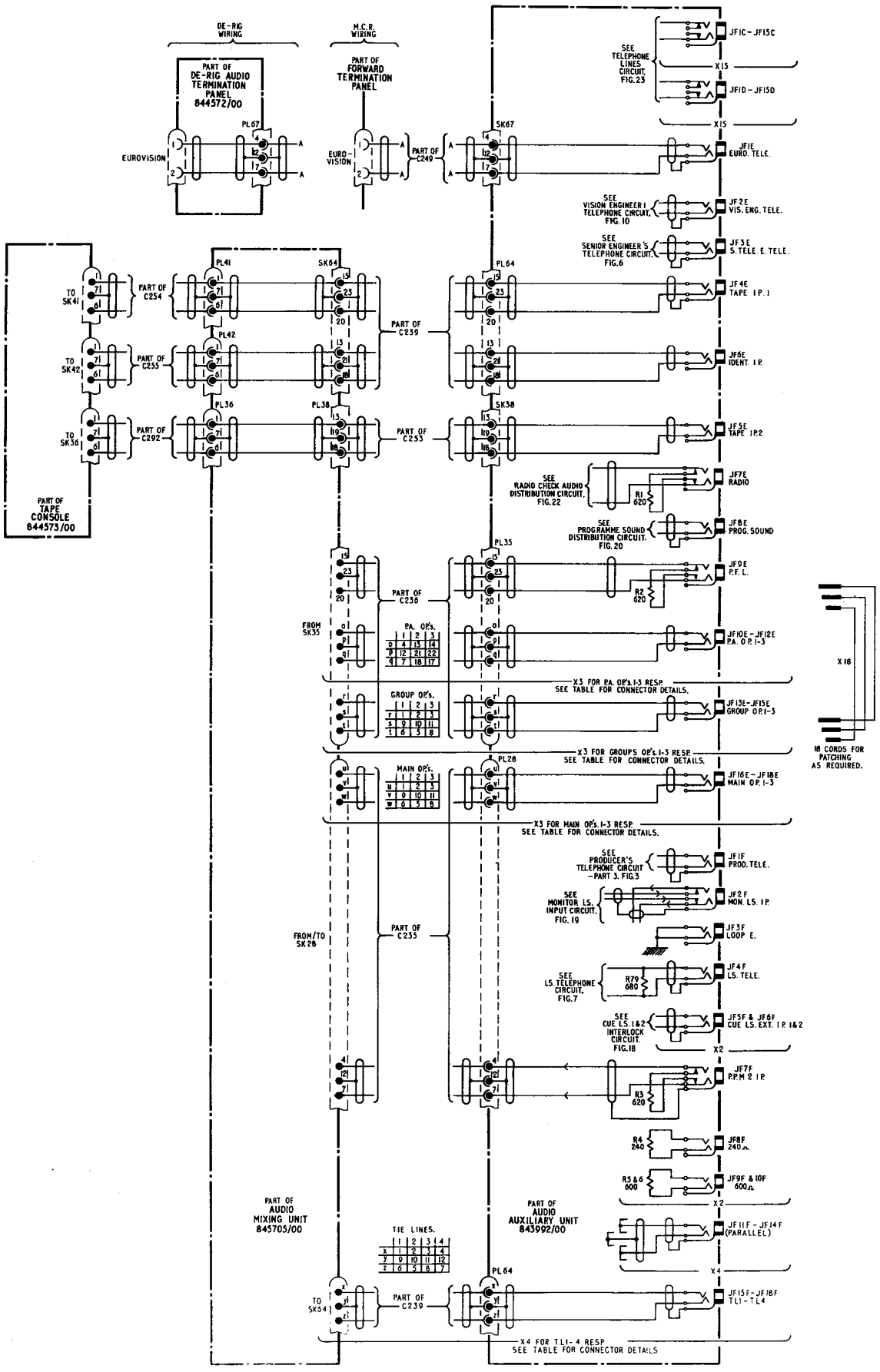
ENGINEERING TALKBACK D.C. SUPPLIES CIRCUIT

DTP2736
(Issue 1)



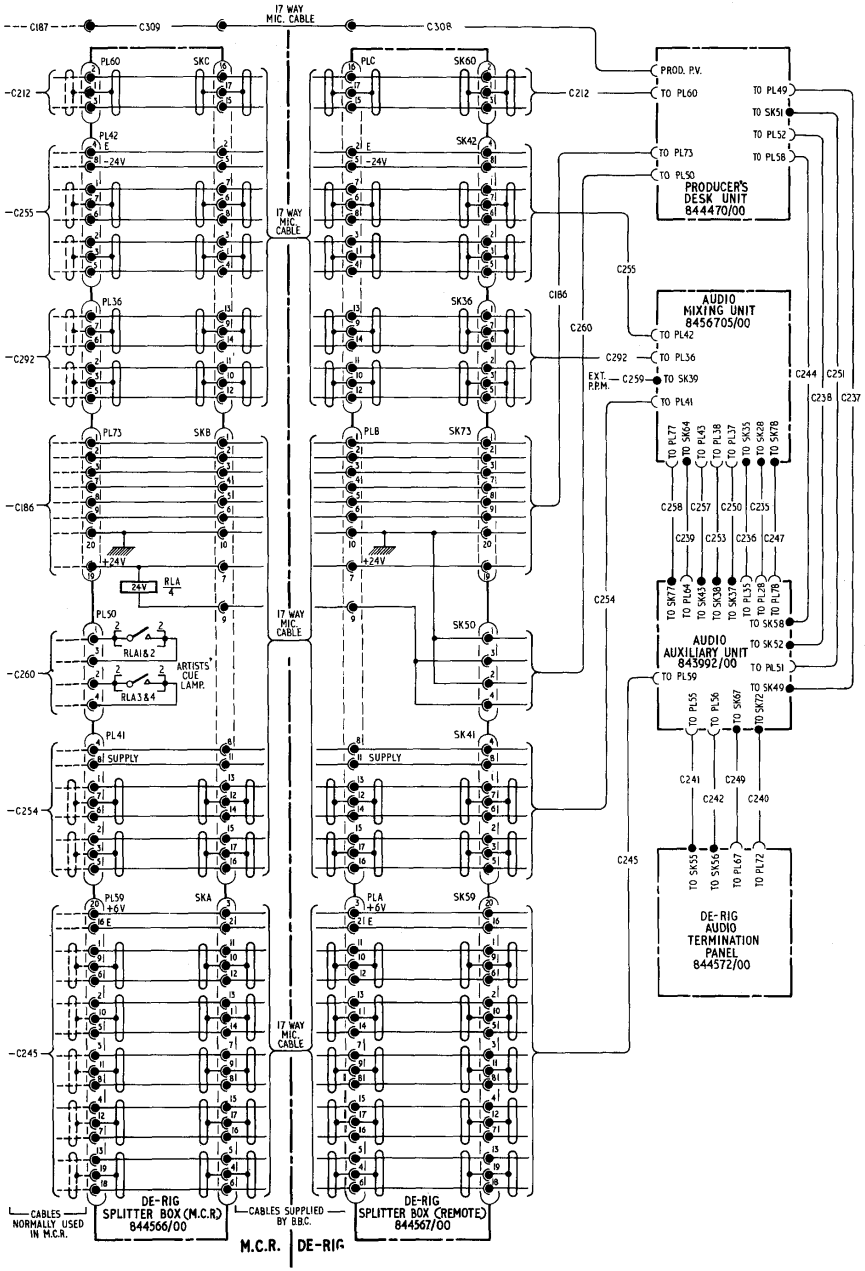
TALKBACK & MIXER POWER SUPPLIES CIRCUIT

DTP2737
(Issue 1)



JACKFIELDS C-F CIRCUIT

DTP2738
(Issue 1)



PARTIAL DE-RIG AUDIO CIRCUIT

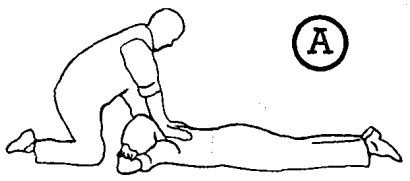
DTP2739
(Issue 1)

TREATMENT FOR ELECTRIC SHOCK

Human beings are rarely killed outright by electric shock and can, in most cases, be saved by immediate commencement of artificial respiration. Electric shock affects the nerves controlling the breathing and the action of the heart and unless prompt aid is given the victim may become unconscious and die. ALWAYS SEND FOR BUT NEVER WAIT FOR A DOCTOR.

Before touching the injured person, make sure that he is not in contact with a live conductor. If he is, break the circuit by opening the power switch - DO NOT TOUCH THE VICTIM WITH YOUR BARE HANDS. If it is not possible to switch off the current, use a piece of dry insulating material, such as wood, bakelite or rubber, to knock or push aside the conductor. Alternatively, pull the victim free using a leather belt or braces, protecting yourself still further by standing on a folded newspaper or a dry mackintosh.

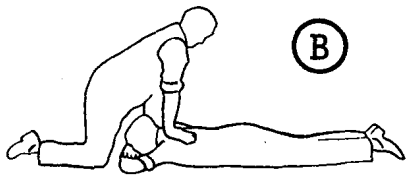
HOLGER NIELSON METHOD OF ARTIFICIAL RESPIRATION



(1) Immediately the patient is released from electrical contact loosen his collar and any tight clothing as quickly as possible.

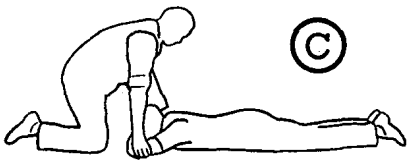
(2) Remove false teeth and sweets etc. from the patient's mouth and make sure that the tongue is free by giving two or three firm slaps with the flat of the hand between the shoulder blades.

(3) Lay the patient face downwards with the forehead resting on the fore arms so that the mouth and nose are kept clear of the ground (A).



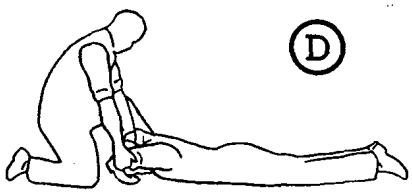
(4) Kneel on one knee a little in front of and to the side of the patient's head so that the left foot is at the side of the patient's elbow. (A). The arms should slope forward so that the hands lie close together on the patient's shoulders with the wrists over the top of the shoulder blades. This is the starting position.

(i) Rock forward on outstretched arms until the arms are vertical above the patient's body (B). The pressure should be light and without force; the movement should take approximately 2 seconds.



(ii) Release the pressure by allowing the hands to slide quickly down the patient's arms to the elbows taking approximately $\frac{1}{2}$ a second (C). Then raise his arms and shoulders slightly, at the same time moving your body backwards (D), taking approximately 2 seconds.

(iii) Lower the patient's arms until they touch the ground (E), and return your hands to the original position on his shoulders and resume the position as before. Take approximately $\frac{1}{2}$ a second for this movement.



(5) Repeat the movements described in (i); (ii) and (iii) so that the complete cycle takes approximately six seconds. That is, about nine complete respirations per minute.

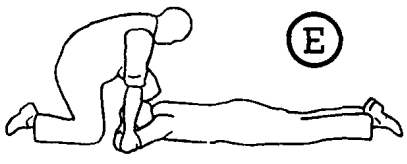
(6) Whilst artificial respiration is continued have someone else:-

(a) Loosen patient's clothing and keep him warm.

(b) Send for a doctor.

(c) Watch so that they can take over if prolonged treatment is necessary.

(7) Keep going for at least four hours even if there is no sign of recovery.



(8) Do not move the patient until he is breathing normally without assistance. There should be no hurry to move him after he has recovered.

(9) Do not give the patient oxygen or other stimulants unless ordered to by a doctor. When fully recovered the patient may be allowed to drink cold water with, if available, one teaspoonful of Sal Volatile to a glass. He may also be permitted to sniff smelling salts.

TREATMENT FOR BURNS

If as a result of electric shock the patient is suffering from burns, the following treatment should be given without hindrance to artificial respiration:-

(1) Remove the clothing near the affected part to enable the burn/s to be treated, taking care not to break any blisters that may have formed.

(2) Saturate the burn/s using a warm solution made up of one desertspoonful of bi-carbonate of soda and a pint of warm water. If bi-carbonate of soda is not available, use a teaspoonful of salt.

(3) Cover the burns with lint soaked in the above solution and apply a bandage taking care not to burst any blisters that may have formed.

(4) If a solution as above is not available cover the burns with a sterile dressing to exclude the air.