

### TRANSMITTER INPUT BAY BA13/513

The BA13/513 comprises the majority of video and sound input equipment, monitoring equipment and control equipment that is used with transmitting installations built to the UHF/77\* specification.

A complete bay comprises a number of the following units; the particular items fitted depend upon local requirements.

Monitoring Tone Detector	AM3/4B
Distribution Amplifier	AM4/519
Line Sending Amplifier	AM7/2A
U.H.F. Transmitter Demodulator	DM1M/501
Low Pass Filter	FL4/33
Low Pass Filter	FL4/39
Fuse Panel	FR/7
Jackfield	JF3/504
Peak Programme Meter	ME12/4
Programme Failure Monitor	MN1/1A
Sync Pulse Monitor	MN1/502B
Field Sync Detector Unit	MN1/505
Line and Field Sync Monitor	MN1/508
Sound Automatic Monitor Minor	MN2M/2
Television Automatic Monitor (Transmitter)	MN2M/505
Television Automatic Monitor Minor	MN2M/508
Oscillator	OS2/31
Transmitter Control Panel	PA6/523
Mains Distribution Panel	PA9/5
Distribution Panel	PA9/510
Change-over Relay Panel	PA17/525
Power Supplier	PS2/49
Power Supplier	PS2/68
Power Supplier	PS3/27

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\*Instruction P.7 Section 2: UHF/77 Television  
Transmitting Stations

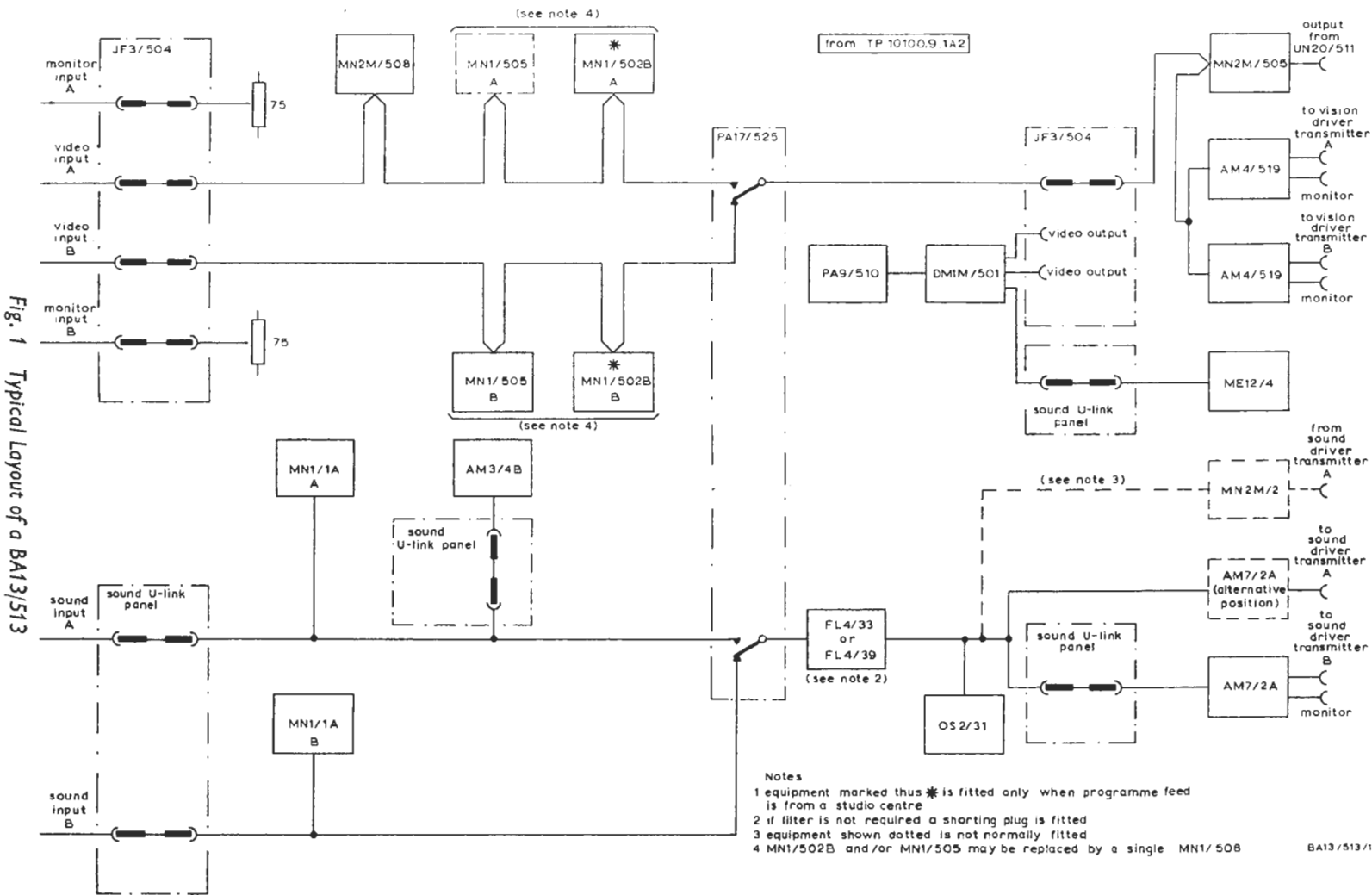


Fig. 1 Typical Layout of a BA13/513

Notes  
 1 equipment marked thus \* is fitted only when programme feed is from a studio centre  
 2 if filter is not required a shorting plug is fitted  
 3 equipment shown dotted is not normally fitted  
 4 MN1/502B and/or MN1/505 may be replaced by a single MN1/508

### Programme and Monitoring Chain

Fig. 1 shows all the usual video-and-sound programme input and monitoring equipment that can be fitted. Normally the video and sound A-chains are selected for use by means of the Change-over Relay Panel PA17/525. The selection is controlled by (a) line- and field-sync pulse detectors, MN1/502B and MN1/505 respectively, across the video inputs and (b) programme failure monitors, MN1/1A, across the sound signal inputs.

When a composite video signal appears on the A-chain, relay RLA, in the Transmitter Control Panel PA6/523, is energised via relay contacts in the sync-pulse detectors and in a Television Automatic Monitor MN2M/508.

Relay RLA controls relays RLa and RLb, in the PA17/525, which switch the A-video signal to the inputs of the two AM4/519 video amplifiers to feed the associated driver transmitters. The output from the PA17/525 provides also a reference signal for a Television Monitor (Transmitter) MN2M/505. If the A-video signal fails, change-over relays in the PA17/525 cannot operate unless there is a video signal present on the B-chain. When the B-video signal is present, relay RLB, in the PA6/523, is energised and prepares the PA17/525 for a change-over if required.

The sound signal change-over system is similar to that used for the video chain. When a signal is present on the sound A-chain the MN1/1A operates to complete a circuit to energise relay RLC, in the PA6/523, and relays RLe, RLf and RLg in the PA17/525. If the sound signal is derived from an r.b.r. relay RLC is not energised unless the level of the incoming carrier is sufficient to energise a carrier sensing relay in the receiver. Relay RLD in the PA6/523 is energised upon receipt of a signal on the B-sound chain. The sound signal output from the PA17/525 is used to feed one driver transmitter directly and the other via an AM7/2A amplifier.

A 23-kHz monitoring tone at a level of  $-30$  dB is usually superimposed on the outgoing sound signal. This tone is injected at the output of the PA17/525 from an OS2/31 oscillator. If monitoring tone is superimposed on the incoming sound signal it is necessary to suppress it before superimposing the local 23 kHz. This suppression is done by the use of a filter, either an FL4/33 or an FL4/39. The FL4/33, which has a higher insertion loss than the FL4/39, is used to suppress all tones higher in frequency than 18.5 kHz. The FL4/39 suppresses 23-kHz tone only.

Normally either the A- or B-video and the A- or B-sound inputs can be used independently, the A-chain being preferred. If the A- and B-feeds originate from different sources the change-over system must be arranged to ensure that the video and sound signals are taken from one chain only. This is achieved by altering connections to terminal block TBE, as detailed in Table 1, and across relay contact RLC-7 in the PA6/523.

In certain circumstances self oscillation of r.b.r. systems can occur and it is necessary to use a 23-kHz tone detector, type AM3/4B, to lock the PA17/525 to the B-chain until the 23-kHz tone on the A-chain is restored. There is then a few seconds delay before the change-over relays operate because the operation of relay RLj in the PA17/525 is purposely delayed. When an AM3/4B is fitted, shorting straps which are normally across RLa-1 and RLe-1 in the PA17/525 must be removed.

### Choice of Video Monitoring Equipment

Monitoring equipment differs according to local circumstances. The three most common arrangements are:

- (a) *A- and B-video feeds from line:*  
A-chain—MN1/502B and MN2M/508  
B-chain—MN1/502B and MN1/505
- (b) *A-video feed from line and B-video feed from an r.b.r.*  
A-chain—MN1/502B and MN2M/508  
B-chain—MN1/505
- (c) *A- and B-video feeds from an r.b.r. or an s.h.f. link*  
A-chain—MN2M/508  
B-chain—MN1/505

Where a particular unit is absent a shorting connection is made on the appropriate terminal block. Later versions of the bay may have the MN1/502B and MN1/505 monitors replaced by a single MN1/508.

### Automatic Control

Change-over of the associated driver transmitters and start up or close down of the r.f. amplifiers is controlled by the PA6/523. Assuming that the video and sound change-over circuits are not locked together as described previously the amplifiers start when either A- or B-video signals and A- or B-sound signals are received. Amplifier closedown is initiated by the loss of A- and B-field sync pulses. The amplifiers then switch off when their internal timers have run down unless the field sync pulses return in the meantime.

When the amplifiers are radiating normally the vision transmission is monitored by a Television Automatic Monitor (Transmitter) MN2M/505. If the monitor judges that the detected output of the vision amplifier is not, within limits, the same as the output of the PA17/525, relay RLQ in the PA6/523 is de-energised. This causes a driver transmitter and r.f. amplifier change-over to the low-power condition. The change-over takes place, if the fault does not clear in the meantime, after a delay of approximately 30 seconds. The delay is incorporated in the r.f. amplifier control circuits.

If serious incoming faults such as high signal level or large amplitude impulsive interference occur the executive action of the MN2M/505 is inhibited, by relay contact RLA-2 in the PA6/523. This is necessary to prevent a change-over operation which might be due solely to limiting in the amplifiers or operation of clamp circuits in the driver transmitters and in the monitor.

A Sound Automatic Monitor Minor MN2M/2, to compare the input and output of the sound amplifier, can be fitted to the bay but is not usually installed.

### Bay Wiring

External connections are made to the BA13/513 via 15 twelve-way terminal blocks which are mounted in a tray at the rear of the bay. The connections between the external circuits and the component parts of the BA13/513 are detailed in Table 1 and Figs. 2, 3 and 4. References to PLA and PLB are concerned with two 33-way plugs on the PA6/523. Connections to these plugs are detailed in Table 2.

In some instances it is necessary to switch both mains and 50-volt supplies at the same time. This is achieved by taking certain bay wiring via auxiliary contacts of fuse-switches on the associated 415-volt switchboard.

**Table 1**  
Bay Block Interconnections

Terminal block		From or to		Duty	To or from		Remarks
			Pin			Pin	
TBA	1	FR/7	F1	} Prog V (A)	TBF	4	} -50 V
	2	TBF	1		PLA	13	
	3	FR/7	F2	} Prog S (A)	TBF	7	} -50 V
	4	TBF	5		PLA	14	
	5	FR/7	F3	For PA17/525	TBE	12	-50 V
	6	TBE	6	Main Chain On	PLA	15	-50 V
	7	FR/7	F4	} For Amplifier on circuits	TBA	8	} -50 V
	8	TBA	7		PLA PLB	1	
	9	FR/7	F5	} RF Out (Main)	TBL	10	} 50 V, via 415-V switchboard and carrier fail detectors
	10	TBL	10		PLA	16	
	11	FR/7	F6	} Switch to Auto	TBL	11	} -50 V, via 415-V switchboard, power control and amplifier circuits
	12	TBL	11		PLA	17	

Table 1 (continued)

Terminal block	From or to		Duty	To or from		Remarks	
		Pin			Pin		
TBB	1	FR/7	F7	} Video Modulation	MN2M/505	1	} -50 V
	2	MN2M/505	2		PLA	18	
	3	FR/7	F8	} Sound Modulation	MN2M/2	19	} Not normally used
	4	MN2M/2			PLA		
	5	FR/7	F9	} Water level	Water level ccts		
	6	Water level ccts			PLA	20	-50 V
	7	FR/7	F10	Spare			-50 V
	8			Spare	PLA	28	
	9	FR/7	F11	} Prog V (B)	TBF	10	} -50 V
	10	TBF	8		PLB	13	
	11	FR/7	F12	} Prog S (B)	B-MN1/1A	9	} -50 V
	12	B-MN1/1A	8		PLB	14	
TBC	1	FR/7	F13	Spare			-50 V
	2	PLA		Spare	PLB	15	
	3	FR/7	F14	} RF Out (Reserve)	TBC	4	} -50 V, via 415-V switchboard and inter-carrier failure detector
	4	TBC	3		PLB	14	
	5	FR/7	F15	Spare			-50 V
	6			Spare	PLB	17	
	7	FR/7	F16	} Ventilation auto start			} -50 V, where required
	8	Ventilation start cct			PLB	3	
	9	FR/7	F17	} For alarm chain	TBC	10	} -50 V
	10	TBC	9		TBG	8	
					PLA	2	}
					PLB	2	
11	FR/7	18	} For Local/Remote switching	TBC	12	} -50 V	
12	TBC	11		PLA	25		

Table 1 (continued)

Terminal block	From or to		Duty	To or from		Remarks	
		Pin			Pin		
TBD	1	PLA	21 } Amplifier Inhibit	} Amplifier A			
	2	PLA	22 } Circuit-A				
	3	PLA	23 } Amplifier Start	} Amplifier A			
	4	PLA	24 } Circuit-A				
	5	PLA	29 } Amplifier Switch-down	} Amplifier A			
	6	PLA	30 } Circuit-A Vision				
	7	PLB	21 } Amplifier Inhibit	} Amplifier B			
	8	PLB	22 } Circuit-B				
	9	PLB	23 } Amplifier Start	} Amplifier B			
	10	PLB	24 } Circuit-B				
	11	PLB	29 } Amplifier Switch-down	} Amplifier B			} Not normally used
	12	PLB	30 } Circuit-B Sound				
TBE	1	PA17/525-SKTX	1 For video signal change-over	TBE	9		
	2	PA17/525-SKTX	} For video signal-A mute	RC5M/501	2	Earth	
	3	RC5M/501		1	Earth		
	4		Spare				
	5	PA17/525-SKTX	5 For sound signal change-over	TBE TBE	8 10	} Earth	
	6	PA17/525-SKTX	6 Main Chain On	TBA	6		-50 V
	7		Spare				
	8	TBE	5 For sound signal change-over	PLA	5	Earth	
	9	TBE	1 For video signal change-over inhibit	PLA TBE	6 11	} Earth	
	10	TBE	5 For sound signal change-over inhibit	PLB	5		Earth
	11	TBE	9 For video signal change-over inhibit	PLB	6	Earth	
	12	TBA	5 -50 V to PA17/525	PA17/525-PLZ	5,6	-50 V	

Notes: If RCM/501 is not fitted TBE-2 is strapped to TBE-3.  
If video and sound change-over is to be tied together strap TBE-1 to TBE-10 and remove connection between TBE-5 and TBE-8.

Table 1 (continued)

Terminal block	From or to		Duty	To or from		Remarks	
		Pin			Pin		
TBF	1	MN1/502B or MN1/508	8	} Prog V (A)	TBA	2	} - 50 V
	2	MN1/505A	10		MN1/502B or MN1/508	9	
	3	MN2M/508	4	MN1/505	9		
	4	TBA	1	MN2M/508	9,10		
	5	MN1/1A	8	} Prog S (A)	TBA	4	} - 50 V
	6	A-RCM/501	4		A-MN1/1A	9	
	7	TBA	3		A-RCM/501	5	
	8	B-MN1/502B or MN1/508	8	} Prog V (B)	TBB	10	} - 50 V
	9	B-MN1/505	10		B-MN1/502B or MN1/508	9	
	10	TBB	9		B-MN1/505	9	
	11			Spare			
	12			Spare			

Notes: If A-RCM/501A is not fitted TBF-6 is strapped to TBF-7.  
 If A-MN1/502B is not fitted TBF-1 is strapped to TBF-2.  
 If B-MN1/502B is not fitted TBF-8 is strapped to TBF-9.  
 If A-MN1/505 is not fitted TBF-2 is strapped to TBF-3.  
 If MN2M/508 is not fitted TBF-3 is strapped to TBF-4.

TBG	1	PLA	31	} For Amplifier-A on	} Amplifier-A	} - 50 V, via 415-V switchboard		
	2	PLA	32					
	3	PLA TBG	3 6	} 23-kHz oscillator output	} PA6/59 SKTB		8	
	4	PLA TBG	4 5				} PA6/59 SKTB	7
	5	OS2/31	10		PLA TBG		4 4	
	6	OS2/31	13	PLA TBG	3 3			
	7			Spare				
	8	PLA TBC TBG	8 9 9	} For external alarm, where fitted	TBG		8	- 50 V
	9	PLA	9					
	10	PLA	10					
	11			Spare				
	12			Spare				

Table 1 (continued)

Terminal block		From or to		Duty	To or from		Remarks
			Pin			Pin	
TBH	1	PLB	31	} For Amplifier-B on	Amplifier-B		} -- 50 V, via 415-V switchboard
	2	PLB	32				
	3			Earth			
	4	PLB	4	For ventilation auto-start	Ventilation circuits		
	5			Spare			
	6			Spare			
	7	Buzzer			TBH	8	
	8	TBH	7	} For buzzer circuit	PLB	8	
	9	PLB	9		Buzzer		
	10	PLB	10	} For buzzer remote reset circuit	} Remote reset circuit		- 50 V
	11	PLB	11				
	12	PLB	12				
TBJ	1	PLB	28	System normal signal	TIP/2B, PLC	2	} Earth
	2	PLB	27	Radiate signal	TIP/2B, PLC	3	
	3	PLB	26	Prog V signal	TIP/2B, PLC	4	
	4	PLB	25	Prog S signal	TIP/2B, PLC	5	
	5	PLB	20	Full power signal	TIP/2B, PLC	6	
	6	PLB	19	Water level signal	TIP/2B, PLC	7	
	7	PLB	18	Spare			
	8	PLA	26	} Local/Remote switching	Auto-call safety alarm unit TIP/2B PLB	7	
	9	PLA	27				
	10	PS3/27	6	} 6·3-V a.c. from PS3/27	PLA	7	
	11	PS2/68	5		PLB	7	
	12	PS3/27	4	} Earth	PLA	33	
			TBJ		12		
			PLB		33		
			TBJ		11		



Table 1 (continued)

<i>Terminal block</i>	<i>From or to</i>		<i>Duty</i>	<i>To or from</i>		<i>Remarks</i>	
		Pin			Pin		
TBK	1	PS2/49	10	Earth	AM7/2A	10	
	2	PS2/49	9	-24 V supply	AM7/2A	9	
	3	Earth					
	4			} 23-kHz high level output	OS2/31	7	
	5				OS2/31		
	6			Earth			
	7			Spare			
	8			Spare			
	9			Spare			
	10			Spare			
	11			Spare			
	12			Spare			
TBL	1			Spare			
	2			Spare			
	3			Spare			
	4			Spare			
	5			Spare			
	6			Spare			
	7			Spare			
	8			Spare			
	9			Spare			
	10	Vision carrier failure detector		RF Out Main	Sound carrier failure detector		- 50 V, via 415-V switchboard
	11	A-amplifier		Switch to Auto	B-amplifier		- 50 V, via 415-V switchboard
	12	A-water level alarm circuit		Water Level	B-water level alarm circuit		- 50 V

For wiring of terminal blocks TBM, TBN, TBP and TBQ see Fig. 3.

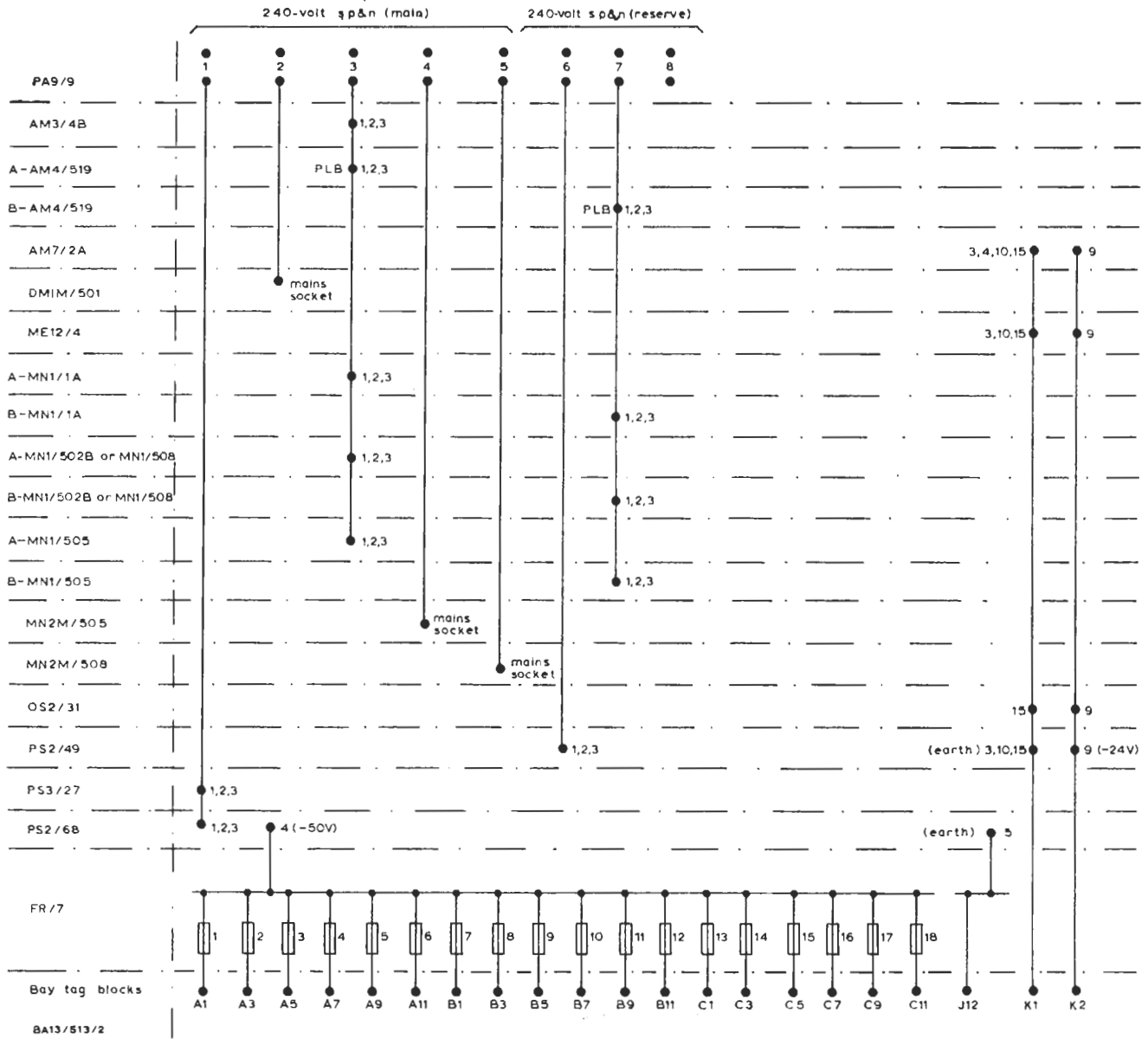
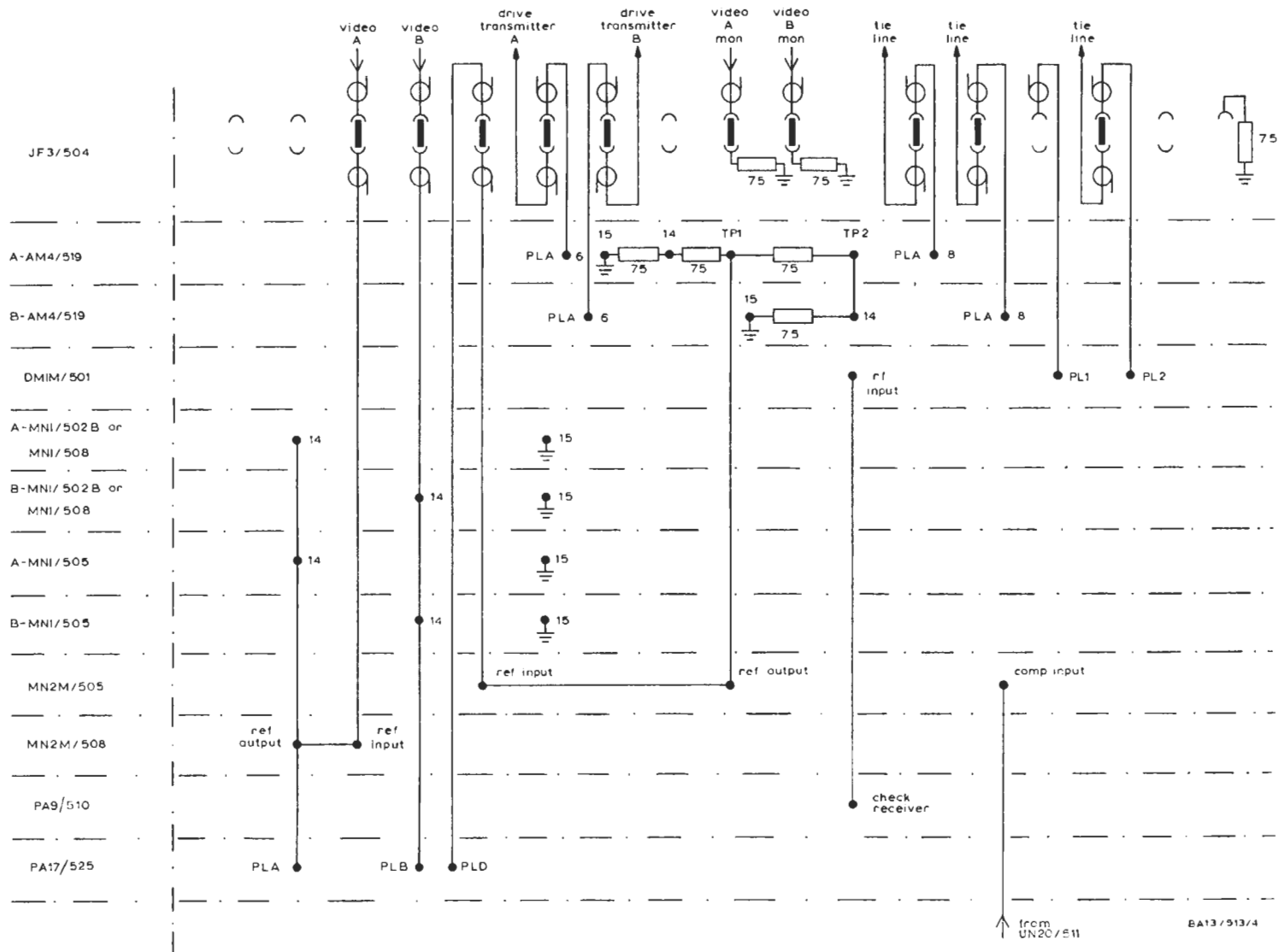


Fig. 2 Diagram of the Mains, 50-volt and 24-volt wiring on a BA13/513

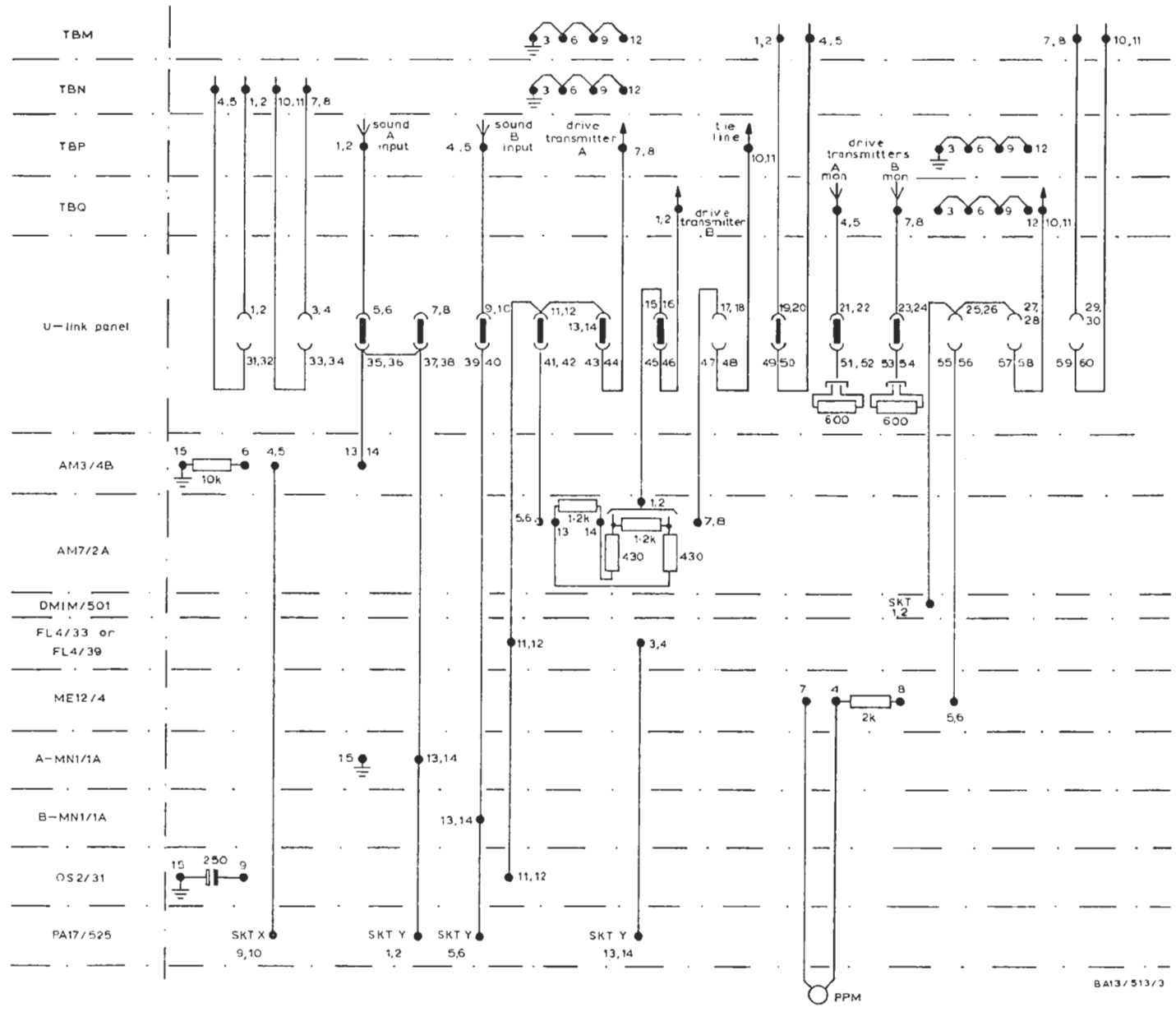
Fig. 3 Video Signal Interconnections on a BA13/513



BA13/513/4

from UN20/511

Fig. 4 Sound Signal Interconnections on a BA13/513



BA13/513/3

**Table 2**  
Connections made to PA6/523

Plug		From		Duty	Remarks
	Pin		Pin		
PLA	1	TBA	8	-50 V for control circuits	Strapped to PLB-1
	2	TBC	10	-50 V for alarm circuits	Strapped to PLB-2
	3	TBG	3,6	} 23-kHz oscillator output	
	4	TBG	4,5		
	5	TBE	8	For sound signal change-over	Earth
	6	TBE	9	For video signal change-over	Earth
	7	TBJ	10	6.3 V a.c. for buzzer	Strapped to PLB-7
	8	TBG	8,9	} For alarm extend circuits when fitted	-50 V
	9	TBG	9		-50 V
	10	TBG	10		
	11	TBG	11	} For auto-start circuit of TIP/2B	
	12	TBG	12		
	13	TBA	2	Prog V (A)	-50 V
	14	TBA	4	Prog S (A)	-50 V
	15	TBA	6	Main Chain On	-50 V
	16	TBA	10	RF Out (Main)	-50 V
	17	TBA	12	Switch to Auto	-50 V
	18	TBB	2	Video modulation	-50 V
	19	TBB	4	Sound modulation	-50 V, not normally used
	20	TBB	6	Water level	-50 V
	21	TBD	1	} For A-amplifier inhibit circuit	
	22	TBD	2		
	23	TBD	3	} For A-amplifier start circuit	
	24	TBD	4		
	25	TBC	12		-50 V
	26	TBJ	8	} For local/remote switching	} to auto-call alarm unit where fitted
	27	TBJ TIP/2B	9 PLB-7		
	28	TBB	8	Spare	
	29	TBD	5	} For A-amplifier switch down circuit	
	30	TBD	6		
	31	TBG	1	} For A-amplifier on circuit	Strapped to PLB-31
	32	TBG	2		
	33	TBJ	11	Earth	Strapped to PLB-33

Table 2 (continued)

Plug		From		Duty	Remarks
	Pin		Pin		
	1	TBA	8	-50 V for control circuit	Strapped to PLA-1
	2	TBC	10	-50 V for alarm circuits	Strapped to PLA-2
	3	TBC	8	} For ventilation auto-start circuits	
	4	TBH	4		
	5	TBE	10	For sound signal change-over inhibit	Earth
	6	TBE	11	For video signal change-over inhibit	Earth
	7	TBJ	10	6.3 V a.c. from PS3/27	Strapped to PLA-7
	8	TBH	8	} For buzzer	
	9	TBH	9		
	10	TBH	10	} For buzzer remote reset circuit, where fitted	
	11	TBH	11		
	12	TBH	12		
	13	TBB	10	Prog V (B)	-50 V
	14	TBB	12	Prog S (B)	-50 V
	15	TBC	2	Spare	
	16	TBC	4	R.F. Out (Reserve)	-50 V
	17	TBC	6	Spare	
	18	TBJ	7	Spare	
	19	TBJ	6	Water level signal for TIP/2B	Earth
	20	TBJ	5	Full power signal for TIP/2B	Earth
	21	TBD	7	} B-amplifier inhibit circuit	
	22	TBD	8		
	23	TBD	9	} B-amplifier start circuit	
	24	TBD	10		
	25	TBJ	4	Prog S signal for TIP/2B	Earth
	26	TBJ	3	Prog V signal for TIP/2B	Earth
	27	TBJ	2	Radiate signal for TIP/2B	Earth
	28	TBJ	1	System Normal signal for TIP/2B	Earth
	29	TBD	11	} B-amplifier switch down circuit	
	30	TBD	12		
	31	TBH	1	} B-amplifier on circuit	
	32	TBH	2		
	33	TBJ	12	Earth	Strapped to PLA-33

PLB

LPB 11/69