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OPERATING INSTRUCTIONS AND SYSTEM DESCRIPTION
A 80 R PILOT-TONE CONTROL SYSTEM, MK II

CONTENTS

1. Application, Special features, Advantages

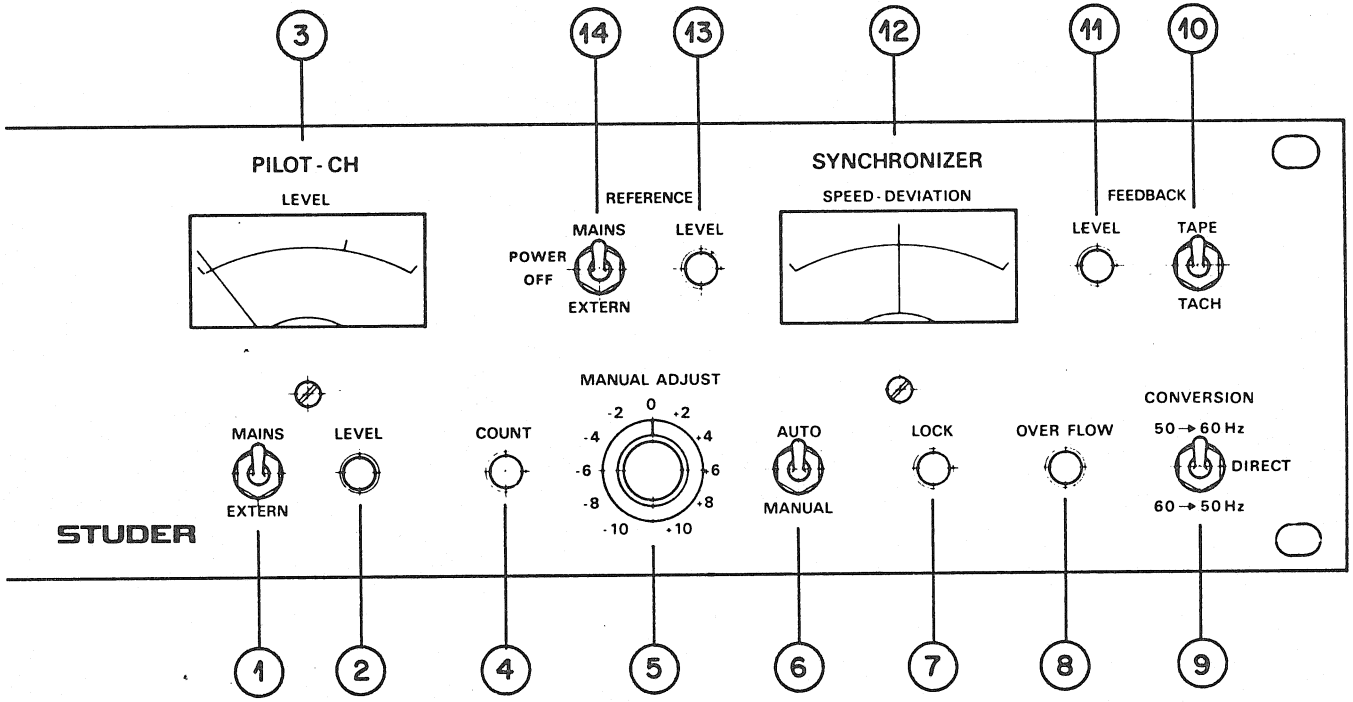
The pilot-tone control system is used in conjunction with tape decks of the A80/R family for synchronising a tape with a reference signal by means of a recorded pilot tone.

The pilot signal can be replaced by a speed signal taken from the capstan motor. To regulate tape speed the follower system employs digital counting techniques followed by analogue processing of the signal. The special features of the system include:

- Minimum wow and flutter, regardless of cuts in the tape or breaks in pilot tone.
- Variable response time of the speed-regulation.
- Memory circuit which maintains the original speed and synchronism, despite gaps in the pilot signal.
- Conditions at start can be selected by "pre-listening" or with the aid of a regulator.
- "Lock" lamp indicates synchronous running.
- False starts can be corrected.
- The feedback signal can be corrected from 50→60 Hz or from 60→50 Hz (option).

2. Parts supplied

A 80 R - 1 :	A 80 broadcasting model, mono, full-track	
A 80 R - 1 - P :	and also	
	pilot-tone amplifier	1.080.932
	pilot-tone head block	1.020.713
A 80 R - 1 - PN :	and also	
	follower control conversion kit	1.080.070
	comprising follower unit, follower panel, fitted back board, etc.	
A 80 R - 1 - PNVU:	and also	
	follower control conversion kit	1.080.075
	comprising follower unit, follower panel with VU-meter, fitted back board, mono cable, etc.	



PILOTTONE PANEL

3. Installation

The electronics of the follower control system are contained in a housing which can be fixed under the "Remote control panel" with two captive screws. The wiring connections between the follower control and the tape deck are shown in Drawing 6.080.070.

Note especially that the pilot follower system (channel feed connector, Add. Stereo VU, EL 21) and the amplifier enclosure (EL 20) are plugged into the power unit of the tape deck. If connected incorrectly, there is no recording as the premag. bias oscillator is not connected. The leads to the panel are drawn through the two hollow members.

4. Condensed instructions

a) Pilot tone record or reproduce

The follow-up system need not be switched on. Switch (14) can stay in the central OFF position.

In the modes "STOP" and "RECORD", scale (3) shows the record level, and in all other modes the reproduce level.

An external or internal mains signal as a signal source for recording the pilot tone can be selected with switch (1) .

The pilot amplifier 1.080.932 has an adjustable record threshold which interrupts recording of the pilot tone at a level of about - 10 dB. An adequate recording level is indicated by lamp (2) (in all modes).

b) Follower control

The power switch for the follower control system is combined with the reference-signal selector switch (14) . With the switch in the middle position the follower control is off and the control signal is interrupted.

To switch on follower control:

Switch (14) to MAINS or EXTERN

Switch (6) to AUTO

Switch (9) to DIRECT

In synchronous operation there are four possible modes:

- Pilot tone from tape synchronous with mains frequency, switch (10) to TAPE, switch (14) to MAINS.
- Pilot tone from tape synchronous with an external reference, switch (10) to TAPE, switch (14) to EXTERN.
- Capstan motor synchronous with mains frequency, switch (10) to TACHO, switch (14) to MAINS.
- Capstan motor synchronous with an external reference, switch (10) to TACHO, switch (14) to EXTERN.

The level light (11) indicates that the level of the signal selected with switch (10) FEEDBACK is adequate.

The level light (13) indicates that the level of the signal selected with switch (14) REFERENCE is adequate.

For trouble-free synchronous operation, both lights must be on. The scale SPEED DEVIATION (12) shows the actual value of the speed correction voltage. The range of correction is generally ± 3 %, e.g. 50 Hz ± 1.5 Hz, of the pilot frequency.

Correct synchronous operation is indicated by lamp (7) LOCK.

Even if the feedback or reference signal is temporarily lost, the analogue memory ensures the follower system continues to run at the original tape speed, and in this way tries to maintain synchronism for as long as possible.

If the OVERFLOW lamp (8) comes on, this indicates that the control system has not been able to follow the reference. The extent of the overflow can be determined by counting the light pulses.

c) Starting in locked mode

To obtain optimum starting with a minima of correction, the analogue memory has to be preset. The following procedure is recommended:

Shortly before transmission (10 minutes or less) the beginning of the tape is monitored with the control system switched on. As soon as the needle of meter (12) has come to rest and the lock lamp (7) is alight, the tape can be rewound and set to the starting position. The correction determined in this way is stored and can be read from the meter in the EDIT mode.

If the storage time is longer, or if the control system or tape deck is switched off between monitoring and transmission, the initial correction can be set by means of control (5) with switch (6) on MANUAL. In the EDIT mode the correction is again shown on the meter.

d) False start

In the event of a false start, inadequate synchronism can be corrected subsequently. First the value read from meter (12) is transferred to control (5), switch (6) is set to MANUAL and the adjustment control is turned clockwise for "catch up" or counterclockwise for "lose". The field counting lamp (4) COUNT indicates how many fields have been corrected. When synchronism is attained, switch (6) is reset to AUTO.

e) Converter (optional)

The frequency of the feedback signal can be altered with a converter. A pilot signal or tacho signal can be transposed from 50 Hz to 60 Hz, or vice versa, with switch (9) CONVERSION.

This facility is used in the case of hybrid operation, for example when a tape carrying a 60 Hz pilot tone is to be synchronised with a 50 Hz system.

5. Pilot tone

1. General

STUDER pilot-tone machines employ the principle of push-pull transversal recording as defined in DIN 15 575.

Two pilot tracks with a width of 0.45 mm and spacing of 0.4 mm are recorded in antiphase at the middle of the tape. The two recordings cancel each other in the reproduce head of the audio channel. However, for the recordings to cancel, it is essential that the two pilot tracks are equally magnetised and the gap angles of pilot head and audio reproduce head are identical.

2. Pilot-tone amplifier 1.080.932

Technical data:

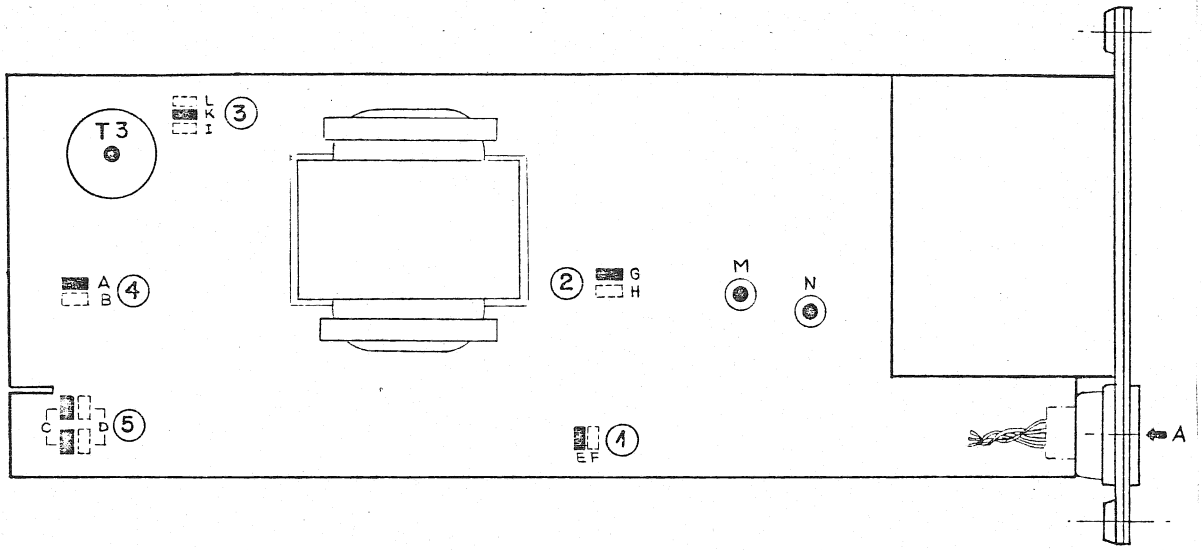
Input	= balanced and floating
Input level	= 300 mV - 5 V
Input impedance (45 - 65 Hz)	= 5 k Ω

Output	= balanced and floating
Output level	= 300 mV - 5 V
Output impedance	= 30 Ω
Threshold adjumstment record and reproduce	= - 20 to 0 dB referred to 1 V
Threshold indication	= open collector output max. load 200 mA 50 V

Technical features:

Pilot-tone amplifier 1.080.932 is a further development of amplifier 1.080.996. Compared with its predecessor it has a number of extra regulators which allow precise adjustment for both tape speeds. The circuit board also has a selection of plug-in jumpers, thus eliminating the need for soldering and unsoldering resistors and jumper links during alignment. Other new additions are separate regulators for adjusting the thresholds for record and reproduce levels, an RF current symmetry regulator, a range selector for RF bias and a selector for connecting the two pilot tracks in-phase or antiphase.

Jumper allocation



Jumpers are shown in the normal operating positions:

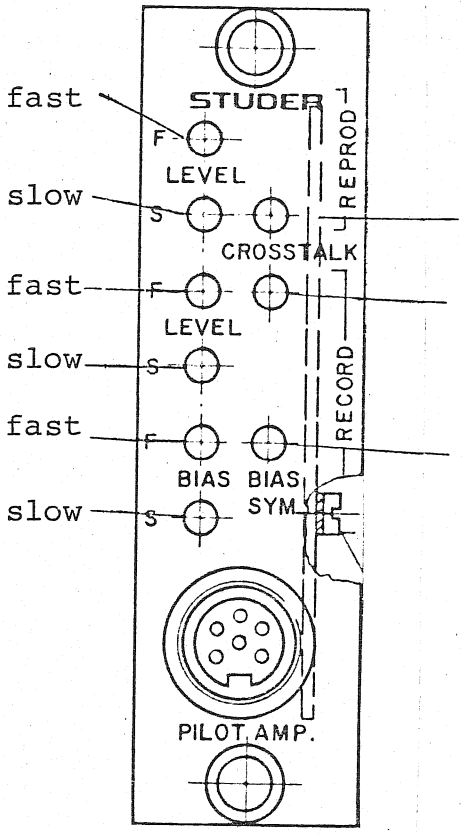
Jumper 1	Threshold switch reproduce:	E = off F = on
Jumper 2	Threshold switch record: (Threshold value is still indicated at G and H)	G = off H = on
Jumper 3	Bias current	J = low K = medium L = high
Jumper 4	Record INHIBIT	A = recording free B = recording blocked (INHIBITED)
Jumper 5	Head phase	C = in phase D = antiphase
Potmeter N		Level threshold reproduce
Potmeter M		Level threshold record
Transformer T 3		Bias transfer

Regulators and connections

Reproduce level

Record level

Bias



Crosstalk compensator reproduce

Crosstalk compensator record

Bias symmetry regulator

1. Input symmetrical
2.
3. 0.0 Volt
4. Output symmetrical
5.
6. Threshold indicator max. + 50 V

3. Alignment of pilot amplifier 1.080.932

Switch off the machine when removing and refitting the pilot amplifier and when changing over the jumpers for the head phase.

a) Mechanical adjustments:

- Set the pilot head to give a clearance of 0.5 mm between head and tape when the tape is stationary. The tape must not touch the head during fast winding.

- With the aid of tape height gauge, check height of head and verticality of pilot head.

- Adjust face of head: Mark surface of head SURFACE with wax crayon. Run machine on reproduce for about 30 sec, stop and check abrasion of wax mark. Wax should rub off the same length on either side of the gap.

- Check tape motion.

Important

The points listed above must be completed before aligning the audio channel as these settings can alter faces of the record and reproduce heads and also the tape movement.

b) Electrical adjustments:

Before making adjustments

Reposition jumpers (see allocation diagram)

1 to E
2 to G
4 to B

Rotate symmetry regulators CROSSTALK REPROD, CROSSTALK RECORD and BIAS SYM. to the middle position (vertical). Plug in pilot amplifier with extender board.

Balancing oscillator frequency

Check oscillator frequency and, if necessary, adjust as under 7.2.2.1.

Change jumper over to A and turn regulators BIAS F and BIAS S to middle position.

Start machine on record (either tape speed) and again check oscillator frequency. If necessary, make fine adjustment to 150 kHz with control spindle of RF transformer T 3.

Reproduce adjustment

Connect voltmeter to pilot line output (pins 4 and 5).

Turn regulators REPROD. LEVEL S and F to middle position. Start pilot test tape at section "Audio recording, reference level 50 Hz" (part 3).

Adjust to minimum at pilot output with regulator REPROD. CROSS-TALK and pilot-head gap-adjusting screw. This adjustment can also be made with a 50 Hz recording recorded on the machine itself. (While recording, set jumper 4 to B so that the pilot track is not recorded over).

Track alignment

Start pilot test tape at section "Audio recording 50 Hz, CENTER PART ERASED (part 4). Adjust height of pilot head until minimum level is obtained at pilot output.

Adjustment of reproduce level

Start pilot test tape at section "Pilot recording, 50 Hz, reference level" (part 5).

Adjust to a pilot output level of 1 Volt, using regulator REPROD. LEVEL F with the fast speed and fast test tape, and using regulator REPROD. LEVEL S with the low speed and slow test tape.

Record adjustment

Bias adjustment (push-pull technique) connect jumper 5 to D. Connect voltmeter to line output of audio channel.

Feed in level of 1 Volt 50 Hz at pilot input (pins 1 and 2).

Thread blank tape and start machine on record. Using regulator RECORD LEVEL F at the fast speed, and regulator RECORD LEVEL S at the slow speed, adjust so that a level about 20 dB below the reference level appears at the audio output.

Turn regulator BIAS F at fast speed and regulator BIAS S at low speed fully to the left. Then turn clockwise until maximum level is obtained at the output. Continue turning in the same direction until the output level is reduced by 0.5 dB.

If this adjustment is not successful using the BIAS regulators, the scope for correction can be altered by changing over jumper 3. J = low, K = medium, L = high bias. Set jumper 5 back to C.

Adjustment of record level

Connect voltmeter to pilot line output (pins 4 and 5). Feed in level of 1 Volt 50 Hz at pilot input. Run the machine for a few seconds on record. Wind back to beginning of recording and start machine on playback. Read output level from voltmeter. If output level differs from desired value (1 Volt), adjust regulator RECORD F (fast speed) and RECORD S (slow speed) by the estimated amount. Repeat this procedure until the correct output level is obtained.

Adjust crosstalk from pilot to audio channel

Connect voltmeter to audio line output.
Feed in level of 1 Volt 50 Hz at pilot input. Start blank tape on record.

Adjust to minimum output level with regulator RECORD CROSSTALK. Make fine adjustment with pilot-head gap-adjusting screw and regulator BIAS SYM. (min. value 58 dB below reference level).

Adjustment of record level threshold

Connect indicator lamp between positive voltage 12 - 24 V and pin 6 of pilot connector.
Feed required threshold voltage to pilot input (normally 10 dB below desired level of 1 Volt). Turn potentiometer M on the pilot amplifier board in the appropriate direction until the switching point of the indicator lamp is reached. Change jumper 2 to H.

Start machine on record and vary the input level so that the indicator lamp is now on, now off. Rewind tape and start machine on replay. Check that recording is made when the lamp is on, and that nothing is recorded when the lamp is off.

Check crosstalk from audio to pilot

Measuring set-up as described above.

Crosstalk < - 14 dB, referred to 1 Volt (< 200 mV).

Adjustment of reproduce level threshold

Connect jumper 1 to F.

Start pilot test tape at section "Pilot recording, 50 Hz, 10 dB below reference level" (part 6). Turn potentiometer N on pilot amplifier board until switching point for reproduce level is reached. Insert pilot amplifier in amplifier rack.

6. Specification

a) Pilot channel

System	Neopilot 2 x 0.45 mm
Input voltage	- 6 to + 12 dB (1 V)
Input impedance	> 6 kΩ, balanced
Output voltage	- 6 to + 12 dB (1 V)
Output impedance	< 30 Ω , balanced
Frequency range	45 - 66 Hz
Blocking thresholds	ca. - 10 dB, variable
Crosstalk rejection	audio signal→pilot: > 14 dB pilot signal→audio channel: > 58 dB

Input level indicator lamp

Adjustment instructions and diagram as given in file.

Pilot-tone amplifier 1.080.932

In conjunction with the follower system, the pilot system is set in accordance with DIN 15 575 to the following values for tape speeds of 38 and 19 cm/s:

Input level	: 1 V
Output level	: 1 V
Blocking threshold, record	: - 10 dB
Blocking threshold, reproduce:	- 10 db

Range of adjustment of pilot signal system: 0.7 to 1.5 V.

b) Follower control

Input level, external reference	: 1 V ± 10 dB
Input impedance, external reference	: > 6 k , balanced
Range of correction:	nominally ± 3 % of tape speed (determined by capstan control in tape deck)
Speed of correction:	variable, nominally 0.5 % of speed variation per second

The follower system is able to cope with a frequency jump (reference or feedback signal) from + 2 % - 2 % (51 Hz to 49 Hz) without loss of pulse (overflow). Wow and flutter (as per DIN weighting) incurred by this correction remains better than 0.1 %.

Time constant of analogue memory of follower system: less than 2 % of speed variation within 10 minutes.

The "lock" lamp lights when: $-180^{\circ} \leq \alpha \leq +180^{\circ}$

The "lock" lamp goes out when: $-360^{\circ} \geq \alpha \geq +360^{\circ}$

The "overflow" lamp flashes when: $-2340^{\circ} \geqslant \alpha \geqslant +2340^{\circ}$

α = electrical phase angle between reference signal and feedback signal.

7. System description

The follower control panel is divided into two parts. On the left is the section for the pilot channel. In the "record" and "stop" modes the meter shows the pilot record level, and in all other modes the reproduce level. A suitable treated and filtered mains signal or an external signal can be selected as the source with the "record" switch.

In all modes, the level indicator lamp comes on when the level is adequate. No pilot recording is made when the lamp is off. On the right are the controls for the follower system. The mains or an external signal can be selected as reference. The selector switch also serves as the main power switch for the entire follower system. In the middle position the power supply to the control system and also the error signal are interrupted. Either the pilot reproduce signal or the tacho signal from the capstan motor can be chosen as the feedback signal. With all the selected signals, adequate level is indicated by the level lamp.

If the pilot signal is chosen as the feedback signal, the follower circuit is interrupted on "stop" and "record". Synchronisation with the capstan motor is still possible, however.

In the "reproduce" mode the follower system can assume three different operating states:

a) Operation is normal if both signals are available at a sufficient level.

When the green lamp is on, this indicates undisturbed operation at the middle of the digital phase-comparison circuit.

In order to minimise wow and flutter when corrections are made, the rate of correction is limited to about 0.5 % of the speed variation per second. This value can be altered with R 38 on the synchronizer board 1.080.908. Even if the control system is unable to follow the reference for the moment, on starting for instance, and the green lamp goes out, up to ± 7 lost pulses are stored and then caught up again. The original lock point is regained.

Pulses are not lost until the red OVERFLOW lamp comes on.

b) If a pilot failure (e.g. dropout) occurs during synchronous running, the control state obtaining hitherto is stored. The original tape speed is retained in order to hold synchronism for as long as possible.

c) The follower system can be switched to manual operation. In this case the correction voltage is set with a regulator knob on the panel.

At the same time, when the reference and feedback signals are present the white field counting lamp COUNT enables the pulses or fields caught up or lost to be counted.

In all modes the speed deviation, i.e. the correcting voltage, is shown on the meter. The scale is marked from - 10 to + 10. Deflection of + 10 denotes the maximum possible positive speed deviation. The range of speed variation is determined by the capstan control board mounted in the tape deck.

8. Circuit description

a) Input selector board 1.080.909

This board carries the circuits for selecting the various signal sources.

Relay K 1 selects between an external reference and 50 Hz references for the follower control system.

Relay K 2 selects between an external pilot input and an internal 50 Hz source.

Relay K 3 switches the level meter from pilot reproduce signal to pilot record signal. The change is controlled by signals from the tape deck.

Relay K 4 connects the power supply and the follower control signal.

The INTERNAL SOURCE 50 Hz is also generated on this board.

The resonance filter is set to exactly 50 Hz or 60 Hz with the aid of R 6.

The 50 Hz level is adjusted with R 4.

R 14 is for adjusting the sensitivity of the level meter.

b) Synchronizer board 1.080.908

In the following description, multiple integrated circuits are identified by their output terminal, e.g. IC 16.6.

The circuit employs digital counting techniques for the purpose of phase comparison. The heart of the circuit ia a 4-bit reversing counter (IC 14) arranged as a difference counter. The counting steps 7 - 8 and 8 - 7 are interrupted by circuitry not on this board. The adding pulses are fed to terminal 5 and are derived from the feedback (pilot) signal. The subtracting pulses are present at terminal 4 and are derived from the reference signal.

The feedback signal goes through active bandpass filter (IC 1) which is set to the correct frequency (55 Hz with 50/60 Hz operation) with R 3. The bandpass filter has a figure of merit of about 5.

This circuit also replaces missing half-waves. IC switches at the zero line and provides a signal appropriate to the TTL logic at the output after Zener diode D 1. IC 3 is for monitoring the level. The actual monitoring circuit comprises a monostable and resettable flipflop IC 9 with a trigger time of about 30 milliseconds. IC 7 divides the tacho signal from 800 Hz down to 50 Hz. The gates IC 8.3, IC 8.8 and IC 8.11 switch the feedback signal from pilot to tacho signal.

The reference signal goes through an active low-pass filter (IC 4). Subsequent processing of the signal and level supervision is the same as for the feedback signal. The 50 nanosecond counting pulses are actually shaped in a delay network (IC 11.2, IC 12.6). The counting pulses can be suppressed at inputs IC 12.3 and IC 12.1. This happens when the counter reaches 7 for the adding input, and 8 for the subtracting input.

IC 16.6 responds when the counter reaches 7,

IC 13.6 at 0 or 16, IC 16.8 at 15, and IC 13.8 at 8.

The lock indicator lamp is on when the counter is at 15 and o, and the overflow lamp at 7 and 8, a value of 8 being possible only by subtraction. The extended level-monitoring signal is generated at IC 10.8. This signal is "low" only when both input signals are present, the follower system is on "automatic" and the tape deck is in the "reproduce" mode. If a break occurs, the lock lamp is blocked, the analogue memory C 17 is disconnected from the phase-comparison circuit via Q 6, and at the same time the counter is made ready for optimum starting when counting begins. The counter is made ready in that it is not blocked at one position, but is slimmed down to a 1-bit counter. The circuit carries out this contraction via the gate IC 12.8 and the load input of IC 14, terminal 11, by passing the value at output terminal 7 to all the present inputs (terminal 1, 9, 10, 15). At output terminal 7 is the counting stage, which switches when the counter passes from 15 to 0 and from 7 to 8 (most significant bit).

This counting stage can set by itself on starting of following a break in the pilot signal. The whole counting sequence is then ready to go about 30 milliseconds later, governed by R 43 and C 15. The mean DC value of the signal at IC 14, terminal 7, is an exact replica of the phase difference between feedback and reference. This signal is integrated in C 20 and C 21 and is available at the output as a correcting signal within limits of $\pm$ 5 V. The speed of response can be varied with the aid of R 37. The stage Q 3 constitutes a constant-current source. Differences in the characteristics of the field effect transistor Q 4 can be adjusted with R 37. Adjustment is made with the follower control switched on.

Reference : 50.0 Hz mains or external

Feedback : tacho (motor)

Put the signal at IC 14, terminal 7 on an osciiloscope and at the point of synchronism adjust for optimum symmetry duty cycle at 50 % with R 37.

If the follower system is fitted with a converter (1.080.919) the jumper link between IC 8 and IC 10 must be removed.

c) Converter board 1.080.919 (option)

The circuit contains a controlled oscillator (IC 2) which under normal circumstances osciilates at 300 Hz. This frequency is divided in two different divider stages (IC 3 and IC 4) into 50/60 Hz and 60/50 Hz, respectively. The division ratio can be controlled electrically.

The output of IC 4 is passed to the phase-comparison circuit (IC 1). The frequency conversion is performed with the aid of a flywheel circuit.

At the input there is a monostable flipflop (IC 7) which halves the input frequency in the event of frequencies above 80 Hz. This enables tape decks with speeds of 15/30 ips to be used as well.

9. Capstan control

The following assemblies can be used for the capstan control system in the tape deck:

a) 1.080.374 / 1.080.372

b) 1.080.376 / 1.080.375

The boards under a) have a wide, electrically controlled range of adjustment of ± 7 semitones ($0.67 < F > 1.5$) with a long-term stability of about 0.2 %. An input for ± 3 % speed variation is also provided, which means this unit can be used for pilot-tone control.

The obtainable speed range is set by a resistor network, and can easily be extended.

The boards under b), with an LC discriminator, give very good long-term capstan-speed stability (about 0.1 %), but the range of speed variation is limited to ± 3 %.

Other boards for the capstan control system,with a crystal reference for example, are in preparation.

Regensdorf, 17th May 1979 FK/js

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1
SYNCHRONIZER PANEL

DESCRIPTION OF PART	TYPE	GR	EL	PT	MAX LEV	SIGNAL NAME	COLOR
LOWER PANEL CONNECTOR	M	1	1	1A	1	B-REF	1
	M	1	1	1B	1	B-COUNT	5
		1	1	1C	1		
	M	1	1	1D	1	S1-MAN	5
	F	1	1	2A	1	B-FEEDB.	2
	M	1	1	2B	1	B-OVER	6
		1	1	2C	1		
	M	1	1	2D	1	S2-MAN	9
	M	1	1	3A	1	B-PILOT	3
	M	1	1	3B	1	S1-TAC-1	7
	M	1	1	3C	1	+ 5.8	3
	M	1	1	3D	1	+ 0.0(2)	0
	M	1	1	4A	1	B-SYNC	4
	M	1	1	4B	1	+ 0.0(1)	0
	M	1	1	4C	1	R-MAN-2	8
	F	1	1	4D	1	+ 5.0	7
UPPER PANEL CONNECTOR	F	1	2	1A	1	ME-VU-2	0
	M	1	2	1B	1	S-CON-60	9
	M	1	2	1C	1	ME-DEV-2	4
	M	1	2	1D	1	S2-TAC-1	6
	M	1	2	2A	1	ME-VU-1	1
	M	1	2	2B	1	S-CON-50	4
	M	1	2	2C	1	ME-DEV-1	5
	M	1	2	2D	1	S2-TAC-2	6
	M	1	2	3A	1	+24.0	2
		1	2	3B	1		
		1	2	3C	1		
	F	1	2	3D	1	K1-1	7
	M	1	2	4A	1	K4-1	3
	M	1	2	4B	1	CHASSIS	0
		1	2	4C	1		
	M	1	2	4D	1	K2-1	8

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1
CABLE TO SYNCHRONIZER PANEL

DESCRIPTION OF PART	LOCATION TYPE	GR	EL	PT	MAX LEV	SIGNAL NAME	COLOR
PANEL CABLE RECEP.(LOWER)	F	2	1	1A	1	B-REF	1
	F	2	1	1B	1	B-COUNT	5
		2	1	1C	1		
	F	2	1	1D	1	S1-MAN	5
	M	2	1	2A	1	B-FEEDB.	2
	F	2	1	2B	1	B-OVER	6
		2	1	2C	1		
	F	2	1	2D	1	S2-MAN	9
	F	2	1	3A	1	B-PILOT	3
	F	2	1	3B	1	S1-TAC-1	7
	F	2	1	3C	1	+ 5.8	3
	F	2	1	3D	1	+ 0.0(2)	0
	F	2	1	4A	1	B-SYNC	4
	F	2	1	4B	1	+ 0.0(1)	0
	F	2	1	4C	1	R-MAN-2	8
	M	2	1	4D	1	+ 5.0	7
PANEL CABLE RECEP.(UPPER)	M	2	2	1A	1	ME-VU-2	0
	F	2	2	1B	1	S-CON-60	9
	F	2	2	1C	1	ME-DEV-2	4
	F	2	2	1D	1	S2-TAC-1	6
	F	2	2	2A	1	ME-VU-1	1
	F	2	2	2B	1	S-CON-50	4
	F	2	2	2C	1	ME-DEV-1	5
	F	2	2	2D	1	S2-TAC-2	6
	F	2	2	3A	1	+24.0	2
		2	2	3B	1		
		2	2	3C	1		
	M	2	2	3D	1	K1-1	7
	F	2	2	4A	1	K4-1	3
	F	2	2	4B	1	CHASSIS	0
		2	2	4C	1		
	F	2	2	4D	1	K2-1	8
PANEL CABLE RECEP.(SYNC.SIDE)	M	2	3	1A	1	ME-VU-2	0
	F	2	3	1B	1	S-CON-60	9
	F	2	3	1C	1	ME-DEV-2	4
	F	2	3	1D	1	S2-TAC-1	6
	F	2	3	2A	1	ME-VU-1	1
	F	2	3	2B	1	S-CON-50	4
	F	2	3	2C	1	ME-DEV-1	5
	F	2	3	2D	1	S2-TAC-2	6
	F	2	3	3A	1	+24.0	2
		2	3	3B	1		
		2	3	3C	1		
	M	2	3	3D	1	K1-1	7
	F	2	3	4A	1	K4-1	3
	F	2	3	4B	1	CHASSIS	0
		2	3	4C	1		
	F	2	3	4D	1	K2-1	8
PANEL CABLE RECEP.(SYNC.SIDE)	F	2	4	1A	1	B-REF	1

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PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1

CABLE TO SYNCHRONIZER PANEL

DESCRIPTION OF PART

TYPE	LOCATION GR	EL	PT	MAX LEV	SIGNAL NAME	COLOR
F	2	4	1B	1	B-COUNT	5
	2	4	1C	1		
F	2	4	1D	1	S1-MAN	5
M	2	4	2A	1	B-FEEDB.	2
F	2	4	2B	1	B-OVER	6
	2	4	2C	1		
F	2	4	2D	1	S2-MAN	9
F	2	4	3A	1	B-PILOT	3
F	2	4	3B	1	S1-TAC-1	7
F	2	4	3C	1	+ 5.8	3
F	2	4	3D	1	+ 0.0(2)	0
F	2	4	4A	1	B-SYNC	4
F	2	4	4B	1	+ 0.0(1)	0
F	2	4	4C	1	R-MAN-2	8
M	2	4	4D	1	+ 5.0	7

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1
SYNCHRONIZER UNIT

DESCRIPTION OF PART	TYPE	LOCATION GR	EL	PT	MAX LEV	SIGNAL NAME	COLOR
EXT. CONN. NO 1 (TO CH.FEED)	F	3	1	1A	1	Y-STOP	0
	M	3	1	1B	1	Y-PRESS	1
		3	1	1C	1		
	M	3	1	1D	1	+24.0	2
	M	3	1	2A	1	AC2	7
		3	1	2B	1		
		3	1	2C	1		
		3	1	2D	1		
	M	3	1	3A	1	+ 0.0(1)	0
		3	1	3B	1		
		3	1	3C	1		
		3	1	3D	1		
	M	3	1	4A	1	Y-RECORD	9
		3	1	4B	1		
		3	1	4C	1		
	F	3	1	4D	1	+ 0.0(2)	0
EXT. CONN. NO 2 (TO PANEL)	F	3	2	1A	1	ME-VU-2	0
	M	3	2	1B	1	S-CON-60	9
	M	3	2	1C	1	ME-DEV-2	4
	M	3	2	1D	1	S2-TAC-1	6
	M	3	2	2A	1	ME-VU-1	1
	M	3	2	2B	1	S-CON-50	4
	M	3	2	2C	1	ME-DEV-1	5
	M	3	2	2D	1	S2-TAC-2	6
	M	3	2	3A	1	+24.0	2
	M	3	2	3B	1	+18.0	2
		3	2	3C	1		
	F	3	2	3D	1	K1-1	7
	M	3	2	4A	1	K4-1	3
	M	3	2	4B	1	CHASSIS	0
		3	2	4C	1		
	M	3	2	4D	1	K2-1	8
EXT. CONN. NO 4 (TO PANEL)	M	3	4	1A	1	B-REF	1
	M	3	4	1B	1	B-COUNT	5
		3	4	1C	1		
	M	3	4	1D	1	S1-MAN	5
	F	3	4	2A	1	B-FEEDB.	2
	M	3	4	2B	1	B-OVER	6
		3	4	2C	1		
	M	3	4	2D	1	S2-MAN	9
	M	3	4	3A	1	B-PILOT	3
	M	3	4	3B	1	S1-TAC-1	7
	M	3	4	3C	1	+ 5.8	3
	M	3	4	3D	1	+ 0.0(2)	0
	M	3	4	4A	1	B-SYNC	4
	M	3	4	4B	1	+ 0.0(1)	0
	M	3	4	4C	1	R-MAN-2	8
	F	3	4	4D	1	+ 5.0	7
EXT. CONN. NO5 (CAPSTAN)	M	3	5	1A	1'	+ 0.0(1)	0

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1
SYNCHRONIZER UNIT

DESCRIPTION OF PART	TYPE	GR	EL	PT	MAX LEV	SIGNAL NAME	COLOR
		3	5	1B	1		
		3	5	1C	1		
	M	3	5	1D	1'	+ 0.0(2)	0
	M	3	5	2A	1	+24.0	2
		3	5	2B	1		
		3	5	2C	1		
	F	3	5	2D	1	- 5.8	1
	F	3	5	3A	1	+ 5.8	3
		3	5	3B	1		
		3	5	3C	1		
	M	3	5	3D	1	YAN-CAP	5
	M	3	5	4A	1	Y-TACHO	9
		3	5	4B	1		
		3	5	4C	1		
	M	3	5	4D	1'	+ 0.0(2)	0
EXT. CONN. NO 6 (TO PIL.AMP)	M	3	6	1A	1	PIL-IN-1	1
	M	3	6	1B	1	AC2	7
	M	3	6	1C	1	+ 0.0(1)	0
	F	3	6	1D	1	PIL-OUT1	5
	M	3	6	2A	1	PIL-IN-2	9
	M	3	6	2B	1	+ 0.0(3)	0
	M	3	6	2C	1	B-PILOT	3
	M	3	6	2D	1	PIL-OUT2	7
	F	3	6	3A	1	PIL-IN*1	4
	M	3	6	3B	1R	+18.0	2
	M	3	6	3C	1	+ 0.0(3)	0
	M	3	6	3D	1	EX.REF-1	2
	M	3	6	4A	1	PIL-IN*2	4
		3	6	4B	1		
		3	6	4C	1		
	M	3	6	4D	1	EX.REF-2	9
SYNCHRONIZER PC CARD	WT	3	9	1A	3*	+ 0.0(1)	0
	WT	3	9	2A	3*	+ 0.0(2)	0
	WT	3	9	3A	3	B-REF	1
	WT	3	9	4A	3	B-FEEDB.	2
	WT	3	9	5A	3	B-SYNC	4
	WT	3	9	6A	3	B-OVER	6
	WT	3	9	7A	3	B-COUNT	5
	WT	3	9	8A	3	R-MAN-2	8
	WT	3	9	9A	3	S1-MAN	5
	WT	3	9	9K		KEY	
	WT	3	9	10A	3	YAN-OUT	4
	WT	3	9	11A	3	Y-PRESS	1
	WT	3	9	12A	3	S2-MAN	9
	WT	3	9	13A	3	YBI-CON2	4
	WT	3	9	14A	3	YBI-CON1	4
	WT	3	9	15A	3	+ 5.0	7
	WT	3	9	16A	3		
	WT	3	9	17A	3	Y-TACHO	9
	WT	3	9	19A	3	S1-TAC-1	7

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1
SYNCHRONIZER UNIT

DESCRIPTION OF PART		LOCATION TYPE	GR	EL	PT	MAX LEV	SIGNAL NAME	COLOR
		WT	3	9	20A	3		
		WT	3	9	22A	3	REF.IN	4
		WT	3	9	23A	3	FEEDB.IN	4
		WT	3	9	24A	3	- 5.8*	4
		WT	3	9	25A	3	+ 5.8*	3
INPUT SELECTOR PC CARD		WT	3	10	1A	3	+ 0.0(1)	0
		WT	3	10	1B	3		
		WT	3	10	2A	3	+ 0.0(2)	0
		WT	3	10	2B	3		
		WT	3	10	3A	3	K1-1	7
		WT	3	10	3B	3		
		WT	3	10	4A	3*	AC2	7
		WT	3	10	4B	3		
		WT	3	10	5A	3	REF.IN	4
		WT	3	10	5B	3		
		WT	3	10	6A	3	EX.REF-1	2
		WT	3	10	6B	3		
		WT	3	10	7A	3	EX.REF-2	9
		WT	3	10	7B	3		
		WT	3	10	8A	3	PIL-IN*1	4
		WT	3	10	8B	3		
		WT	3	10	9A	3	PIL-IN-1	1
		WT	3	10	9B	3		
		WT	3	10	10A	3	PIL-IN*2	4
		WT	3	10	10B	3		
		WT	3	10	11A	3	PIL-IN-2	9
		WT	3	10	11B	3*	+ 0.0(3)	0
		WT	3	10	11K		KEY	
		WT	3	10	12A	3	K2-1	8
		WT	3	10	12B	3		
		WT	3	10	13A	3	FEEDB.IN	4
		WT	3	10	13B	3	PIL-OUT1	5
		WT	3	10	14A	3	PIL-OUT2	7
		WT	3	10	14B	3		
		WT	3	10	15A	3	Y-STOP	0
		WT	3	10	15B	3	ME-VU-1	1
		WT	3	10	16A	3	Y-RECORD	9
		WT	3	10	16B	3*	B-PILOT	3
		WT	3	10	17A	3		
		WT	3	10	17B	3*	+18.0	2
		WT	3	10	18A	3	S2-TAC-1	6
		WT	3	10	18B	3	ME-DEV-1	5
		WT	3	10	19A	3	YAN-CAP	5
	&	WT	3	10	19A	3	S2-TAC-2	6
		WT	3	10	19B	3		
		WT	3	10	20A	3	K4-1	3
		WT	3	10	20B	3	ME-VU-2	0
		WT	3	10	21A	3		
		WT	3	10	21B	3	YAN-OUT	4
		WT	3	10	22A	3	+ 0.0(3)	4
		WT	3	10	22B	3		

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1
SYNCHRONIZER UNIT

DESCRIPTION OF PART	LOCATION TYPE	GR	EL	PT	MAX LEV	SIGNAL NAME	COLOR
	WT	3	10	23A	3*	+24.0	2
	WT	3	10	23B	3	ME-DEV-2	4
	WT	3	10	24A	3*	- 5.8	1
	WT	3	10	24B	3	- 5.8*	4
	WT	3	10	25A	3*	+ 5.8	3
	WT	3	10	25B	3	+ 5.8*	4
FREQUENCY CONVERTER	WT	3	11	1A	3	+ 0.0(1)	0
	WT	3	11	2A	3	+ 0.0(2)	0
	WT	3	11	3A	3		
	WT	3	11	4A	3		
	WT	3	11	5A	3		
	WT	3	11	6A	3		
	WT	3	11	7A	3		
	WT	3	11	8A	3		
	WT	3	11	9A	3	S-CON-50	4
	WT	3	11	10A	3	S-CON-60	9
	WT	3	11	11A	3		
	WT	3	11	12A	3		
	WT	3	11	13A	3	YBI-CON2	4
	WT	3	11	14A	3	YBI-CON1	4
	WT	3	11	15A	3		
	WT	3	11	16A	3		
	WT	3	11	17A	3		
	WT	3	11	18A	3		
	WT	3	11	19A	3		
	WT	3	11	20A	3		
	WT	3	11	21A	3		
	WT	3	11	22A	3		
	WT	3	11	23A	3R	+24.0	2
	WT	3	11	24A	3R	- 5.8	6
	WT	3	11	25A	3	+ 5.8	5

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1
CABLE TO PILOT IN/OUT UNIT

DESCRIPTION OF PART	TYPE	GR	EL	PT	MAX LEV	SIGNAL NAME	COLOR
PILOT CABLE (SYNCHR.SIDE)	F	4	1	1A	1	PIL-IN-1	1
		4	1	1B	1		
	F	4	1	1C	1	+ 0.0(1)	0
	M	4	1	1D	1	PIL-OUT1	5
	F	4	1	2A	1	PIL-IN-2	9
		4	1	2B	1		
	F	4	1	2C	1	B-PILOT	3
	F	4	1	2D	1	PIL-OUT2	7
	M	4	1	3A	1	PIL-IN*1	4
		4	1	3B	1		
	F	4	1	3C	1	SCREEN-1	
	F	4	1	3D	1	EX.REF-1	2
	F	4	1	4A	1	PIL-IN*2	4
		4	1	4B	1		
		4	1	4C	1		
	F	4	1	4D	1	EX.REF-2	9
PILOT CABLE (PANEL SIDE)	L	4	2	1	1	PIL-IN-1	1
	L	4	2	2	1		
	L	4	2	3	1	PIL-IN*1	4
	L	4	2	4	1		
	L	4	2	5	1	EX.REF-1	2
	L	4	2	7	1	PIL-OUT2	7
	L	4	2	8	1	PIL-IN-2	9
	L	4	2	9	1		
	L	4	2	10	1	PIL-IN*2	4
	L	4	2	11	1		
	L	4	2	12	1	EX.REF-2	9
	L	4	2	13	1	+ 0.0(1)	0
	L	4	2	14	1	PIL-OUT1	5

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1
PILOT-TONE INPUT/OUTPUT UNIT

DESCRIPTION OF PART	LOCATION TYPE	GR	EL	PT	MAX LEV	SIGNAL NAME	COLOR
FEED TO SYNCHRONIZER,RECEPT.	L	5	1	1	1	PIL-IN-1	1
	L	5	1	2	1		
	L	5	1	3	1	PIL-IN*1	4
	L	5	1	4	1		
	L	5	1	5	1	EX.REF-1	2
	L	5	1	6	1	B-PILOT	3
	L	5	1	7	1	PIL-OUT2	7
	L	5	1	8	1	PIL-IN-2	9
	L	5	1	9	1		
	L	5	1	10	1	PIL-IN*2	4
	L	5	1	11	1		
	L	5	1	12	1	EX.REF-2	8
	L	5	1	13	1	+ 0.0(1)	0
	L	5	1	14	1	PIL-OUT1	5
EXTERNAL REFERENCE INPUT	L	5	2	1	3	+ 0.0(1)	0
	L	5	2	2	3	EX.REF-1	2
	L	5	2	3	3	EX.REF-2	8
PILOT OUTPUT RECEPTICAL	L	5	3	1	3	+ 0.0(1)	0
	L	5	3	2	3	PIL-OUT1	5
	L	5	3	3	3	PIL-OUT2	7
PILOT INPUT PLUG	L	5	4	1	3	+ 0.0(1)	0
	L	5	4	2	3	PIL-IN-1	1
	L	5	4	3	3	PIL-IN-2	9
FEED TO PILOT AMPLIFIER	L	5	5	1	1	PIL-IN*1	4
	L	5	5	2	1	PIL-IN*2	4
	L	5	5	3	1	+ 0.0(1)	0
	L	5	5	4	1	PIL-OUT1	5
	L	5	5	5	1	PIL-OUT2	7
	L	5	5	6	1	B-PILOT	3

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PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1

CABLE TO CHANNEL FEED CONN.

DESCRIPTION OF PART	LOCATION TYPE	GR	EL	PT	MAX LEV	SIGNAL NAME	COLOR
CH.FEED CABLE (SYNCHR. SIDE)	M	6	1	1A	1	Y-STOP	0
	F	6	1	1B	1	Y-PRESS	1
		6	1	1C	1		
		6	1	1D	1		
	F	6	1	2A	1	AC2	7
		6	1	2B	1		
		6	1	2C	1		
		6	1	2D	1		
	F	6	1	3A	1	0-AC2	7
		6	1	3B	1		
		6	1	3C	1		
		6	1	3D	1		
	F	6	1	4A	1	Y-RECORD	9
		6	1	4B	1		
		6	1	4C	1		
		6	1	4D	1		
CH.FEED CABLE (CONNECT.SIDE)	L	6	2	1	1		
	L	6	2	2	1	Y-STOP	0
	L	6	2	3	1		
	L	6	2	4	1		
	L	6	2	5	1		
	L	6	2	6	1		
	L	6	2	7	1	0-AC2	7
	L	6	2	8	1		
	L	6	2	9	1	Y-PRESS	1
	L	6	2	10	1		
	L	6	2	11	1	Y-RECORD	9
	L	6	2	12	1		
	L	6	2	13	1		
	L	6	2	14	1	AC2	7

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PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1

CABLE TO CAPSTAN FEED CONN.

DESCRIPTION OF PART	TYPE	LOCATION GR	EL	PT	MAX LEV	SIGNAL NAME	COLOR
MOLEX RECEPTICAL (CAPSTAN)	F	7	1	1A	1	+ 0.0(1)	0
		7	1	1B	1		
		7	1	1C	1		
	F	7	1	1D	1	+ 0.0(2)	0
	F	7	1	2A	1	+24.0	2
		7	1	2B	1		
		7	1	2C	1		
	M	7	1	2D	1	- 5.8	1
	M	7	1	3A	1	+ 5.8	3
		7	1	3B	1		
		7	1	3C	1		
	F	7	1	3D	1	YAN-CAP	5
	F	7	1	4A	1	Y-TACHO	(1)
		7	1	4B	1		
		7	1	4C	1		
	F	7	1	4D	1	SCREEN-2	
CONNECTOR PLUG (CAPSTAN)	L	7	2	1	1	+ 0.0(1)	0
	L	7	2	2	1	+24.0	2
	L	7	2	3	1	+ 5.8	3
	L	7	2	4	1		
	L	7	2	5	1		
	L	7	2	6	1		
	L	7	2	7	1	Y-TACHO	(1)
	L	7	2	8	1	+ 0.0(2)	0
	L	7	2	9	1		
	L	7	2	10	1	- 5.8	1
	L	7	2	11	1		
	L	7	2	12	1	YAN-CAP	5
	L	7	2	13	1	SCREEN-2	
	L	7	2	14	1		

END OF LIST

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1

* = GROUP NODE
= = INTER GROUP NODE
) = DIRECT WIRE TO '='
' = WIRING NOT COMPUTED

SIGNAL NAME	COLOR	LOCATION TYPE	GR	EL	PT		DESCRIPTION OF PART
+ 0.0(1)	0	M	1	1	4B		LOWER PANEL CONNECTOR
		F	2	1	4B		PANEL CABLE RECEP.(LOWER)
		F	2	4	4B		PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	1	3A		EXT. CONN. NO 1 (TO CH.FEED)
		M	3	4	4B		EXT. CONN. NO 4 (TO PANEL)
		M	3	5	1A	'	EXT. CONN. NO5 (CAPSTAN)
		M	3	6	1C		EXT. CONN. NO 6 (TO PIL.AMP)
		WT	3	9	1A	*	SYNCHRONIZER PC CARD
		WT	3	10	1A		INPUT SELECTOR PC CARD
		WT	3	11	1A		FREQUENCY CONVERTER
		F	4	1	1C		PILOT CABLE (SYNCHR.SIDE)
		L	4	2	13		PILOT CABLE (PANEL SIDE)
		L	5	1	13		FEED TO SYNCHRONIZER,RECEPT.
		L	5	2	1		EXTERNAL REFERENCE INPUT
		L	5	3	1		PILOT OUTPUT RECEPTICAL
		L	5	4	1		PILOT INPUT PLUG
		L	5	5	3		FEED TO PILOT AMPLIFIER
		F	7	1	1A	'	MOLEX RECEPTICAL (CAPSTAN)
		L	7	2	1		CONNECTOR PLUG (CAPSTAN)
+ 0.0(2)	0	M	1	1	3D		LOWE- PANEL CONNECTOR
		F	2	1	3D		PANEL CABLE RECEP.(LOWER)
		F	2	4	3D		PANEL CABLE RECEP.(SYNC.SIDE)
		F	3	1	4D		EXT. CONN. NO 1 (TO CH.FEED)
		M	3	4	3D		EXT. CONN. NO 4 (TO PANEL)
		M	3	5	1D	'	EXT. CONN. NO5 (CAPSTAN)
		M	3	5	4D	'	EXT. CONN. NO5 (CAPSTAN)
		WT	3	9	2A	*	SYNCHRONIZER PC CARD
		WT	3	10	2A		INPUT SELECTOR PC CARD
		WT	3	11	2A		FREQUENCY CONVERTER
		F	7	1	1D		MOLEX RECEPTICAL (CAPSTAN)
		L	7	2	8		CONNECTOR PLUG (CAPSTAN)
+ 0.0(3)	0	M	3	6	2B		EXT. CONN. NO 6 (TO PIL.AMP)
		M	3	6	3C		EXT. CONN. NO 6 (TO PIL.AMP)
		WT	3	10	11B	*	INPUT SELECTOR PC CARD
		WT	3	10	22A		INPUT SELECTOR PC CARD
+ 5.0	7	F	1	1	4D		LOWER PANEL CONNECTOR
		M	2	1	4D		PANEL CABLE RECEP.(LOWER)
		M	2	4	4D		PANEL CABLE RECEP.(SYNC.SIDE)
		F	3	4	4D		EXT. CONN. NO 4 (TO PANEL)
		WT	3	9	15A		SYNCHRONIZER PC CARD
+ 5.8	3	M	1	1	3C		LOWER PANEL CONNECTOR
		F	2	1	3C		PANEL CABLE RECEP.(LOWER)
		F	2	4	3C		PANEL CABLE RECEP.(SYNC.SIDE)

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1

SIGNAL NAME	COLOR	LOCATION TYPE	GR	EL	PT		DESCRIPTION OF PART
		M	3	4	3C		EXT. CONN. NO 4 (TO PANEL)
		F	3	5	3A		EXT. CONN. NO5 (CAPSTAN)
		WT	3	10	25A	*	INPUT SELECTOR PC CARD
		WT	3	11	25A		FREQUENCY CONVERTER
		M	7	1	3A		MOLEX RECEPTICAL (CAPSTAN)
		L	7	2	3		CONNECTOR PLUG (CAPSTAN)
+ 5.8*	3	WT	3	9	25A		SYNCHRONIZER PC CARD
		WT	3	10	25B		INPUT SELECTOR PC CARD
+18.0	2	M	3	2	3B		EXT. CONN. NO 2 (TO PANEL)
		M	3	6	3B	R	EXT. CONN. NO 6 (TO PIL.AMP)
		WT	3	10	17B	*	INPUT SELECTOR PC CARD
+24.0	2	M	1	2	3A		UPPER PANEL CONNECTOR
		F	2	2	3A		PANEL CABLE RECEP.(UPPER)
		F	2	3	3A		PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	1	1D		EXT. CONN. NO 1 (TO CH.FEED)
		M	3	2	3A		EXT. CONN. NO 2 (TO PANEL)
		M	3	5	2A		EXT. CONN. NO5 (CAPSTAN)
		WT	3	10	23A	*	INPUT SELECTOR PC CARD
		WT	3	11	23A	R	FREQUENCY CONVERTER
		F	7	1	2A		MOLEX RECEPTICAL (CAPSTAN)
		L	7	2	2		CONNECTOR PLUG (CAPSTAN)
- 5.8	1	F	3	5	2D		EXT. CONN. NO5 (CAPSTAN)
		WT	3	10	24A	*	INPUT SELECTOR PC CARD
		WT	3	11	24A	R	FREQUENCY CONVERTER
		M	7	1	2D		MOLEX RECEPTICAL (CAPSTAN)
		L	7	2	10		CONNECTOR PLUG (CAPSTAN)
- 5.8*	4	WT	3	9	24A		SYNCHRONIZER PC CARD
		WT	3	10	24B		INPUT SELECTOR PC CARD
AC2	7	M	3	1	2A		EXT. CONN. NO 1 (TO CH.FEED)
		M	3	6	1B		EXT. CONN. NO 6 (TO PIL.AMP)
		WT	3	10	4A	*	INPUT SELECTOR PC CARD
		F	6	1	2A		CH.FEED CABLE (SYNCHR. SIDE)
		L	6	2	14		CH.FEED CABLE (CONNECT.SIDE)
B-COUNT	5	M	1	1	1B		LOWER PANEL CONNECTOR
		F	2	1	1B		PANEL CABLE RECEP.(LOWER)
		F	2	4	1B		PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	4	1B		EXT. CONN. NO 4 (TO PANEL)
		WT	3	9	7A		SYNCHRONIZER PC CARD
B-FEEDB.	2	F	1	1	2A		LOWER PANEL CONNECTOR
		M	2	1	2A		PANEL CABLE RECEP.(LOWER)
		M	2	4	2A		PANEL CABLE RECEP.(SYNC.SIDE)
		F	3	4	2A		EXT. CONN. NO 4 (TO PANEL)
		WT	3	9	4A		SYNCHRONIZER PC CARD
B-OVER	6	M	1	1	2B		LOWER PANEL CONNECTOR

SIGNAL NAME	COLOR	TYPE	GR	EL	PT		DESCRIPTION OF PART
		F	2	1	2B		PANEL CABLE RECEP.(LOWER)
		F	2	4	2B		PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	4	2B		EXT. CONN. NO 4 (TO PANEL)
		WT	3	9	6A		SYNCHRONIZER PC CARD
B-PILOT	3	M	1	1	3A		LOWER PANEL CONNECTOR
		F	2	1	3A		PANEL CABLE RECEP.(LOWER)
		F	2	4	3A		PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	4	3A		EXT. CONN. NO 4 (TO PANEL)
		M	3	6	2C		EXT. CONN. NO 6 (TO PIL.AMP)
		WT	3	10	16B	*	INPUT SELECTOR PC CARD
		F	4	1	2C		PILOT CABLE (SYNCHR.SIDE)
		L	5	1	6		FEED TO SYNCHRONIZER,RECEPT.
		L	5	5	6		FEED TO PILOT AMPLIFIER
B-REF	1	M	1	1	1A		LOWER PANEL CONNECTOR
		F	2	1	1A		PANEL CABLE RECEP.(LOWER)
		F	2	4	1A		PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	4	1A		EXT. CONN. NO 4 (TO PANEL)
		WT	3	9	3A		SYNCHRONIZER PC CARD
B-SYNC	4	M	1	1	4A		LOWER PANEL CONNECTOR
		F	2	1	4A		PANEL CABLE RECEP.(LOWER)
		F	2	4	4A		PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	4	4A		EXT. CONN. NO 4 (TO PANEL)
		WT	3	9	5A		SYNCHRONIZER PC CARD
CHASSIS	0	M	1	2	4B		UPPER PANEL CONNECTOR
		F	2	2	4B		PANEL CABLE RECEP.(UPPER)
		F	2	3	4B		PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	2	4B		EXT. CONN. NO 2 (TO PANEL)
EX.REF-1	2	M	3	6	3D		EXT. CONN. NO 6 (TO PIL.AMP)
		WT	3	10	6A		INPUT SELECTOR PC CARD
		F	4	1	3D		PILOT CABLE (SYNCHR.SIDE)
		L	4	2	5		PILOT CABLE (PANEL SIDE)
		L	5	1	5		FEED TO SYNCHRONIZER,RECEPT.
		L	5	2	2		EXTERNAL REFERENCE INPUT
EX.REF-2	9	M	3	6	4D		EXT. CONN. NO 6 (TO PIL.AMP)
		WT	3	10	7A		INPUT SELECTOR PC CARD
		F	4	1	4D		PILOT CABLE (SYNCHR.SIDE)
		L	4	2	12		PILOT CABLE (PANEL SIDE)
		L	5	1	12		FEED TO SYNCHRONIZER,RECEPT.
		L	5	2	3		EXTERNAL REFERENCE INPUT
FEEDB.IN	4	WT	3	9	23A		SYNCHRONIZER PC CARD
		WT	3	10	13A		INPUT SELECTOR PC CARD
K1-1	7	F	1	2	3D		UPPER PANEL CONNECTOR
		M	2	2	3D		PANEL CABLE RECEP.(UPPER)
		M	2	3	3D		PANEL CABLE RECEP.(SYNC.SIDE)
		F	3	2	3D		EXT. CONN. NO 2 (TO PANEL)

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1

SIGNAL NAME	COLOR	LOCATION TYPE	GR	EL	PT	DESCRIPTION OF PART
		WT	3	10	3A	INPUT SELECTOR PC CARD
K2-1	8	M	1	2	4D	UPPER PANEL CONNECTOR
		F	2	2	4D	PANEL CABLE RECEP.(UPPER)
		F	2	3	4D	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	2	4D	EXT. CONN. NO 2 (TO PANEL)
		WT	3	10	12A	INPUT SELECTOR PC CARD
K4-1	3	M	1	2	4A	UPPER PANEL CONNECTOR
		F	2	2	4A	PANEL CABLE RECEP.(UPPER)
		F	2	3	4A	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	2	4A	EXT. CONN. NO 2 (TO PANEL)
		WT	3	10	20A	INPUT SELECTOR PC CARD
ME-DEV-1	5	M	1	2	2C	UPPER PANEL CONNECTOR
		F	2	2	2C	PANEL CABLE RECEP.(UPPER)
		F	2	3	2C	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	2	2C	EXT. CONN. NO 2 (TO PANEL)
		WT	3	10	18B	INPUT SELECTOR PC CARD
ME-DEV-2	4	M	1	2	1C	UPPER PANEL CONNECTOR
		F	2	2	1C	PANEL CABLE RECEP.(UPPER)
		F	2	3	1C	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	2	1C	EXT. CONN. NO 2 (TO PANEL)
		WT	3	10	23B	INPUT SELECTOR PC CARD
ME-VU-1	1	M	1	2	2A	UPPER PANEL CONNECTOR
		F	2	2	2A	PANEL CABLE RECEP.(UPPER)
		F	2	3	2A	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	2	2A	EXT. CONN. NO 2 (TO PANEL)
		WT	3	10	15B	INPUT SELECTOR PC CARD
ME-VU-2	0	F	1	2	1A	UPPER PANEL CONNECTOR
		M	2	2	1A	PANEL CABLE RECEP.(UPPER)
		M	2	3	1A	PANEL CABLE RECEP.(SYNC.SIDE)
		F	3	2	1A	EXT. CONN. NO 2 (TO PANEL)
		WT	3	10	20B	INPUT SELECTOR PC CARD
PIL-IN*1	4	F	3	6	3A	EXT. CONN. NO 6 (TO PIL.AMP)
		WT	3	10	8A	INPUT SELECTOR PC CARD
		M	4	1	3A	PILOT CABLE (SYNCHR.SIDE)
		L	4	2	3	PILOT CABLE (PANEL SIDE)
		L	5	1	3	FEED TO SYNCHRONIZER,RECEPT.
		L	5	5	1	FEED TO PILOT AMPLIFIER
PIL-IN*2	4	M	3	6	4A	EXT. CONN. NO 6 (TO PIL.AMP)
		WT	3	10	10A	INPUT SELECTOR PC CARD
		F	4	1	4A	PILOT CABLE (SYNCHR.SIDE)
		L	4	2	10	PILOT CABLE (PANEL SIDE)
		L	5	1	10	FEED TO SYNCHRONIZER,RECEPT.
		L	5	5	2	FEED TO PILOT AMPLIFIER
PIL-IN-1	1	M	3	6	1A	EXT. CONN. NO 6 (TO PIL.AMP)

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1

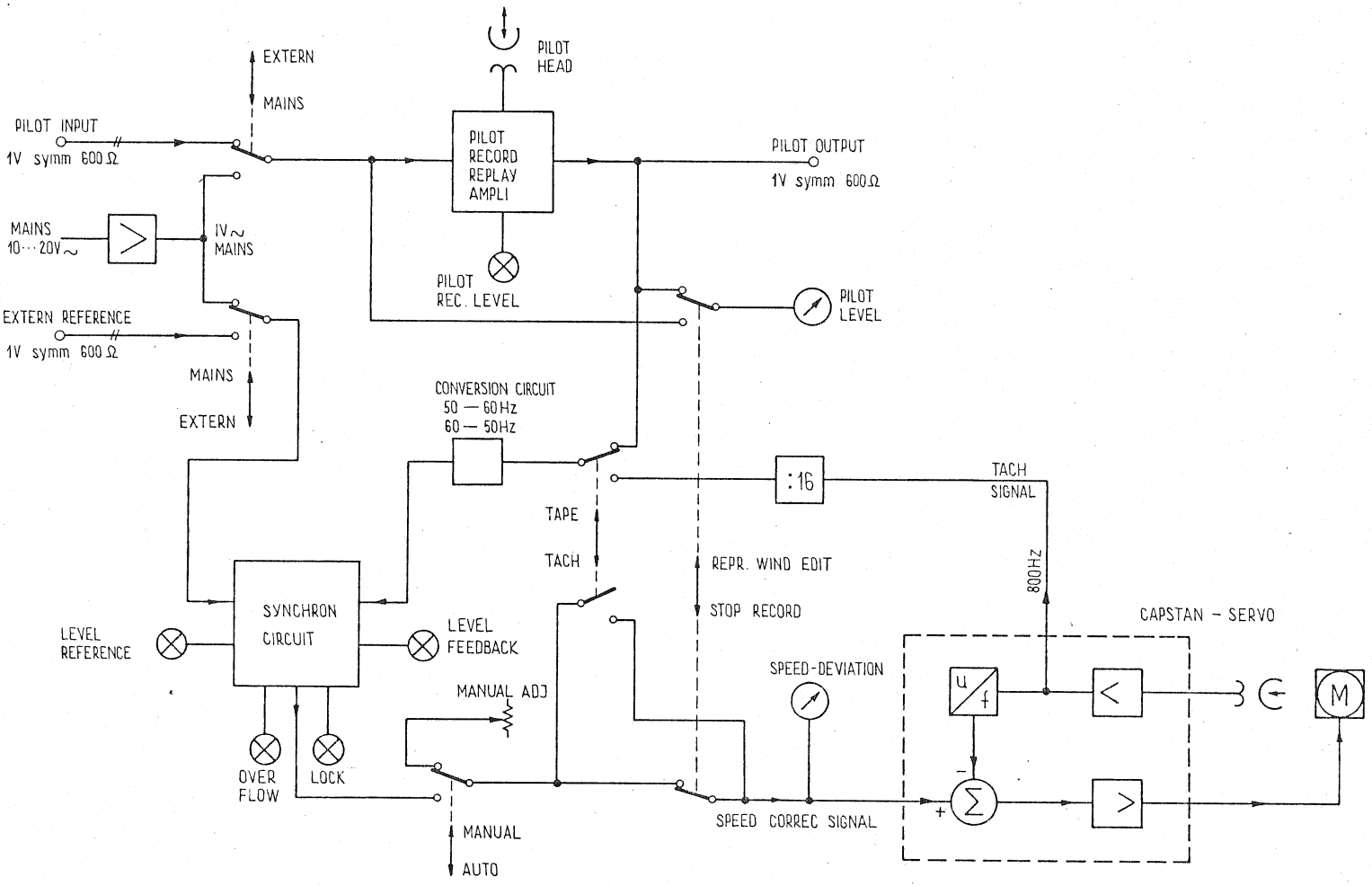
SIGNAL NAME	COLOR	LOCATION TYPE	GR	EL	PT	DESCRIPTION OF PART
		WT	3	10	9A	INPUT SELECTOR PC CARD
		F	4	1	1A	PILOT CABLE (SYNCHR.SIDE)
		L	4	2	1	PILOT CABLE (PANEL SIDE)
		L	5	1	1	FEED TO SYNCHRONIZER,RECEPT.
		L	5	4	2	PILOT INPUT PLUG
PIL-IN-2	9	M	3	6	2A	EXT. CONN. NO 6 (TO PIL.AMP)
		WT	3	10	11A	INPUT SELECTOR PC CARD
		F	4	1	2A	PILOT CABLE (SYNCHR.SIDE)
		L	4	2	8	PILOT CABLE (PANEL SIDE)
		L	5	1	8	FEED TO SYNCHRONIZER,RECEPT.
		L	5	4	3	PILOT INPUT PLUG
PIL-OUT1	5	F	3	6	1D	EXT. CONN. NO 6 (TO PIL.AMP)
		WT	3	10	13B	INPUT SELECTOR PC CARD
		M	4	1	1D	PILOT CABLE (SYNCHR.SIDE)
		L	4	2	14	PILOT CABLE (PANEL SIDE)
		L	5	1	14	FEED TO SYNCHRONIZER,RECEPT.
		L	5	3	2	PILOT OUTPUT RECEPTICAL
		L	5	5	4	FEED TO PILOT AMPLIFIER
PIL-OUT2	7	M	3	6	2D	EXT. CONN. NO 6 (TO PIL.AMP)
		WT	3	10	14A	INPUT SELECTOR PC CARD
		F	4	1	2D	PILOT CABLE (SYNCHR.SIDE)
		L	4	2	7	PILOT CABLE (PANEL SIDE)
		L	5	1	7	FEED TO SYNCHRONIZER,RECEPT.
		L	5	3	3	PILOT OUTPUT RECEPTICAL
		L	5	5	5	FEED TO PILOT AMPLIFIER
R-MAN-2	8	M	1	1	4C	LOWER PANEL CONNECTOR
		F	2	1	4C	PANEL CABLE RECEP.(LOWER)
		F	2	4	4C	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	4	4C	EXT. CONN. NO 4 (TO PANEL)
		WT	3	9	8A	SYNCHRONIZER PC CARD
REF.IN	4	WT	3	9	22A	SYNCHRONIZER PC CARD
		WT	3	10	5A	INPUT SELECTOR PC CARD
S-CON-50	4	M	1	2	2B	UPPER PANEL CONNECTOR
		F	2	2	2B	PANEL CABLE RECEP.(UPPER)
		F	2	3	2B	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	2	2B	EXT. CONN. NO 2 (TO PANEL)
		WT	3	11	9A	FREQUENCY CONVERTER
S-CON-60	9	M	1	2	1B	UPPER PANEL CONNECTOR
		F	2	2	1B	PANEL CABLE RECEP.(UPPER)
		F	2	3	1B	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	2	1B	EXT. CONN. NO 2 (TO PANEL)
		WT	3	11	10A	FREQUENCY CONVERTER
SCREEN-1		F	4	1	3C	PILOT CABLE (SYNCHR.SIDE)
SCREEN-2		F	7	1	4D	MOLEX RECEPTICAL (CAPSTAN)

PILOT - TONE FOLLOW-UP SYSTEM *** STUDER A-80/R *** 76/05/24-1

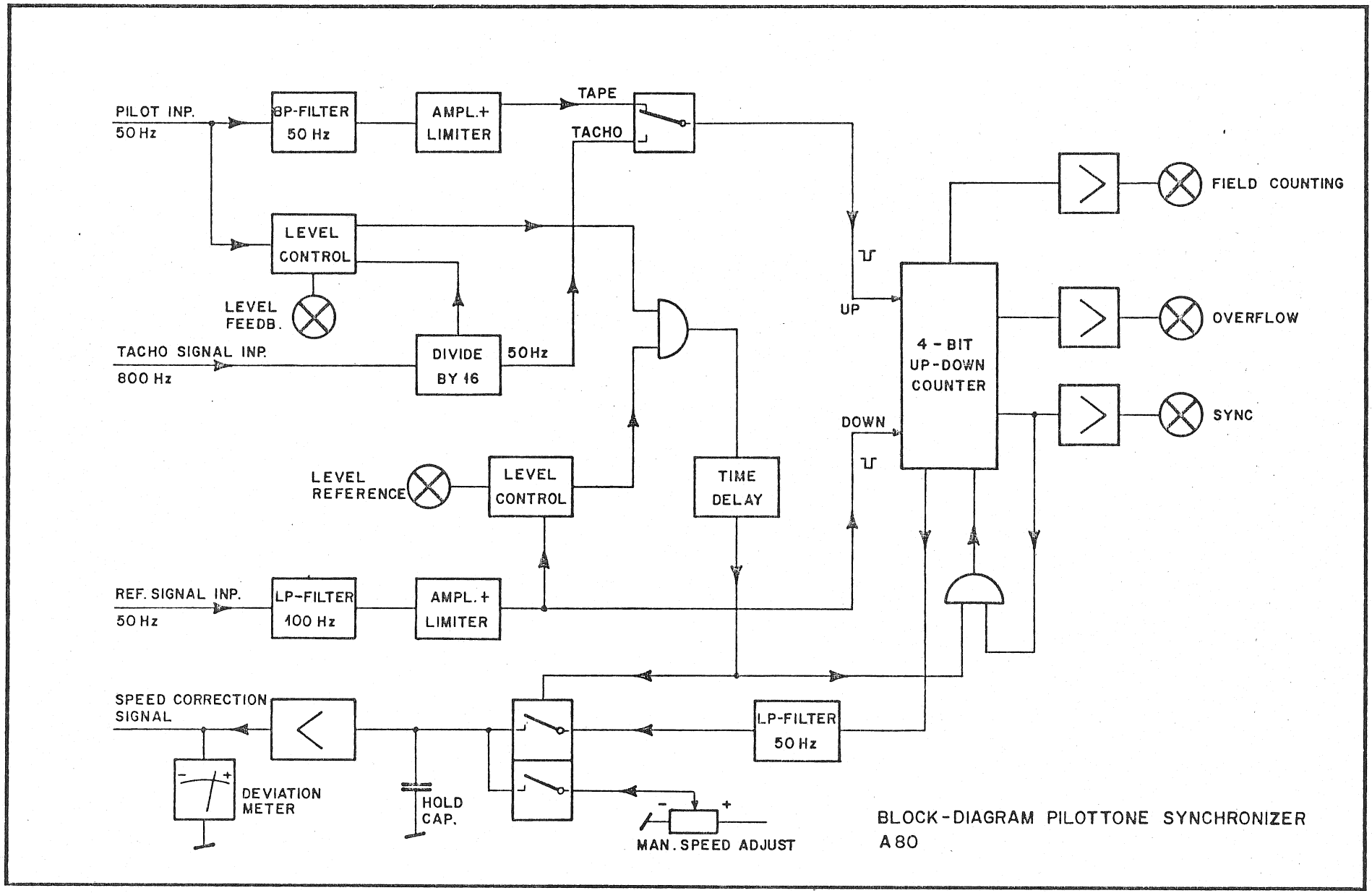
SIGNAL NAME	COLOR	LOCATION TYPE	GR	EL	PT	DESCRIPTION OF PART
		L	7	2	13	CONNECTOR PLUG (CAPSTAN)
S1-MAN	5	M	1	1	1D	LOWER PANEL CONNECTOR
		F	2	1	1D	PANEL CABLE RECEP.(LOWER)
		F	2	4	1D	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	4	1D	EXT. CONN. NO 4 (TO PANEL)
		WT	3	9	9A	SYNCHRONIZER PC CARD
S1-TAC-1	7	M	1	1	3B	LOWER PANEL CONNECTOR
		F	2	1	3B	PANEL CABLE RECEP.(LOWER)
		F	2	4	3B	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	4	3B	EXT. CONN. NO 4 (TO PANEL)
		WT	3	9	19A	SYNCHRONIZER PC CARD
S2-MAN	9	M	1	1	2D	LOWER PANEL CONNECTOR
		F	2	1	2D	PANEL CABLE RECEP.(LOWER)
		F	2	4	2D	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	4	2D	EXT. CONN. NO 4 (TO PANEL)
		WT	3	9	12A	SYNCHRONIZER PC CARD
S2-TAC-1	6	M	1	2	1D	UPPER PANEL CONNECTOR
		F	2	2	1D	PANEL CABLE RECEP.(UPPER)
		F	2	3	1D	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	2	1D	EXT. CONN. NO 2 (TO PANEL)
		WT	3	10	18A	INPUT SELECTOR PC CARD
S2-TAC-2	6	M	1	2	2D	UPPER PANEL CONNECTOR
		F	2	2	2D	PANEL CABLE RECEP.(UPPER)
		F	2	3	2D	PANEL CABLE RECEP.(SYNC.SIDE)
		M	3	2	2D	EXT. CONN. NO 2 (TO PANEL)
		& WT	3	10	19A	INPUT SELECTOR PC CARD
Y-PRESS	1	M	3	1	1B	EXT. CONN. NO 1 (TO CH.FEED)
		WT	3	9	11A	SYNCHRONIZER PC CARD
		F	6	1	1B	CH.FEED CABLE (SYNCHR. SIDE)
		L	6	2	9	CH.FEED CABLE (CONNECT.SIDE)
Y-RECORD	9	M	3	1	4A	EXT. CONN. NO 1 (TO CH.FEED)
		WT	3	10	16A	INPUT SELECTOR PC CARD
		F	6	1	4A	CH.FEED CABLE (SYNCHR. SIDE)
		L	6	2	11	CH.FEED CABLE (CONNECT.SIDE)
Y-STOP	0	F	3	1	1A	EXT. CONN. NO 1 (TO CH.FEED)
		WT	3	10	15A	INPUT SELECTOR PC CARD
		M	6	1	1A	CH.FEED CABLE (SYNCHR. SIDE)
		L	6	2	2	CH.FEED CABLE (CONNECT.SIDE)
Y-TACHO	9	M	3	5	4A	EXT. CONN. NO5 (CAPSTAN)
		WT	3	9	17A	SYNCHRONIZER PC CARD
		F	7	1	4A	MOLEX RECEPTICAL (CAPSTAN)
		L	7	2	7	CONNECTOR PLUG (CAPSTAN)
YAN-CAP	5	M	3	5	3D	EXT. CONN. NO5 (CAPSTAN)

SIGNAL NAME	COLOR	LOCATION TYPE	GR	EL	PT	DESCRIPTION OF PART
		WT	3	10	19A	INPUT SELECTOR PC CARD
		F	7	1	3D	MOLEX RECEPTICAL (CAPSTAN)
		L	7	2	12	CONNECTOR PLUG (CAPSTAN)
YAN-OUT	4	WT	3	9	10A	SYNCHRONIZER PC CARD
		WT	3	10	21B	INPUT SELECTOR PC CARD
YBI-CON1	4	WT	3	9	14A	SYNCHRONIZER PC CARD
		WT	3	11	14A	FREQUENCY CONVERTER
YBI-CON2	4	WT	3	9	13A	SYNCHRONIZER PC CARD
		WT	3	11	13A	FREQUENCY CONVERTER
0-AC2	7	F	6	1	3A	CH.FEED CABLE (SYNCHR. SIDE)
		L	6	2	7	CH.FEED CABLE (CONNECT.SIDE)

END OF LIST



BLOCKDIAGRAM FOLLOW–UP SYSTEM A80/R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BP-FILTER
50 Hz
AMPL.+
LIMITER
TAPE
TACHO
LEVEL
CONTROL
LEVEL
FEEDB.
TACHO SIGNAL INP.
800 Hz
DIVIDE
BY 16
50Hz
UP
DOWN
4 - BIT
UP-DOWN
COUNTER
FIELD COUNTING
OVERFLOW
SYNC
LEVEL
REFERENCE
LEVEL
CONTROL
TIME
DELAY
REF. SIGNAL INP.
50 Hz
LP-FILTER
100 Hz
AMPL.+
LIMITER
SPEED CORRECTION
SIGNAL
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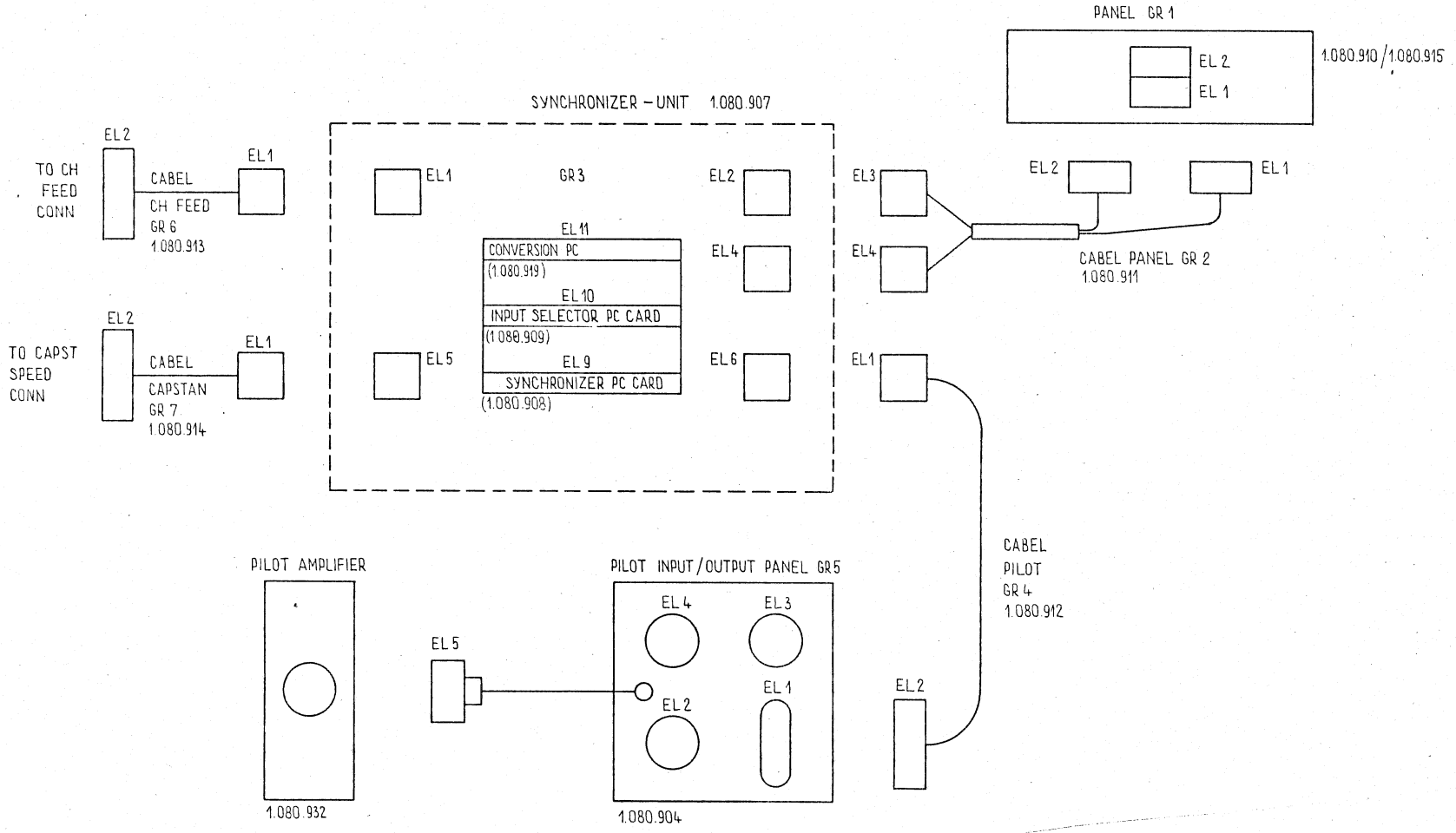
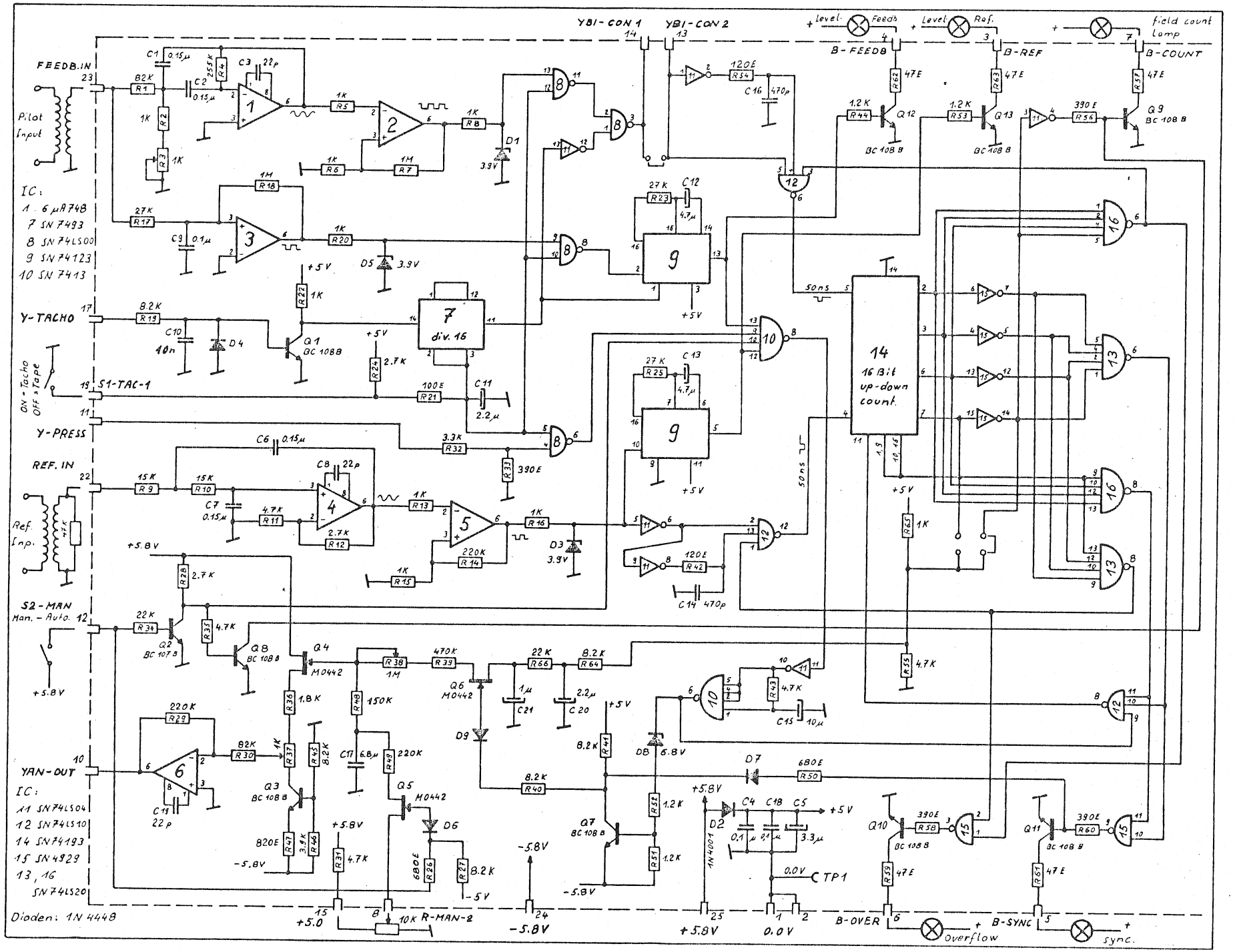
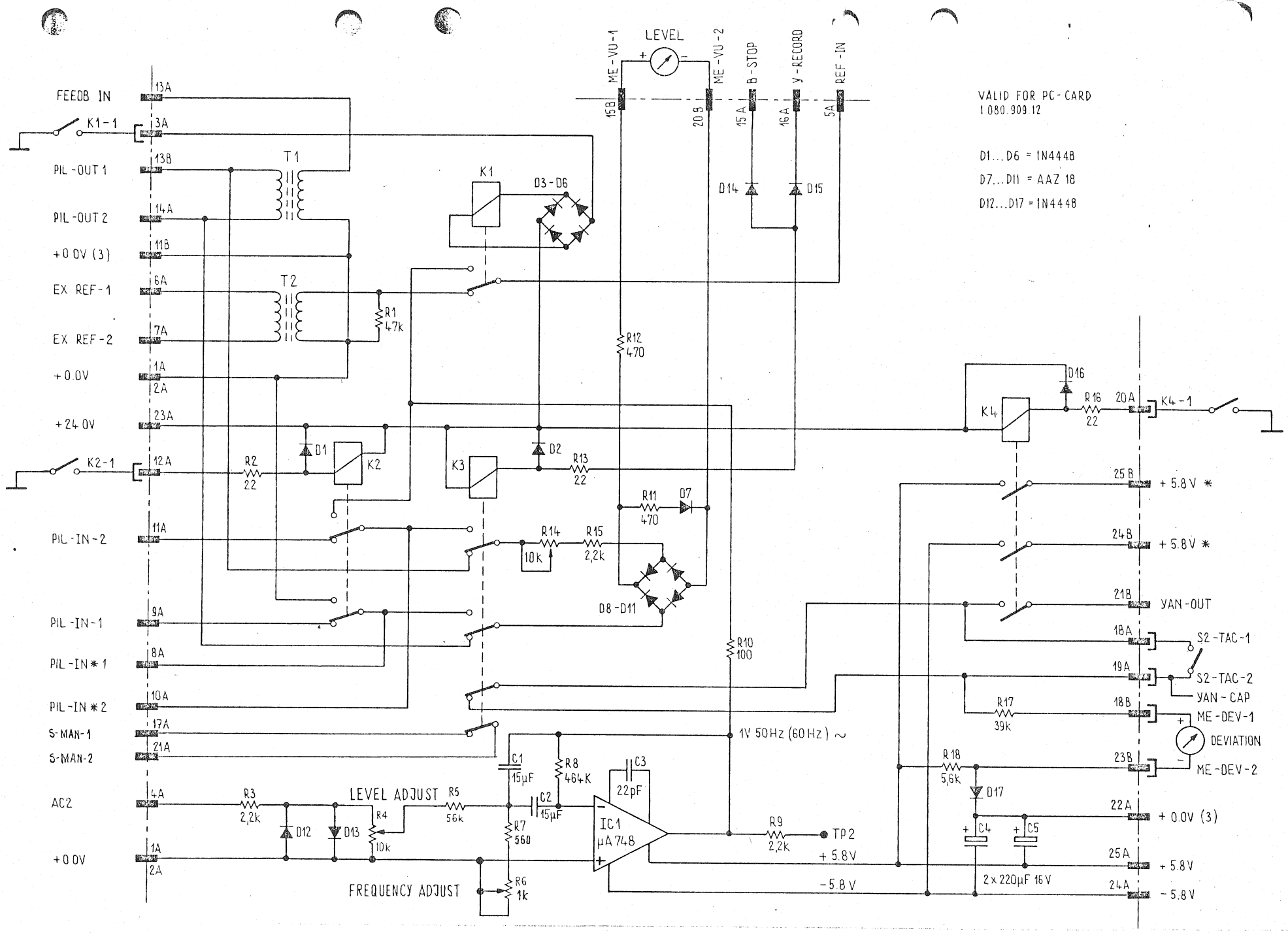
METER
HOLD
CAP.
LP-FILTER
50 Hz
MAN. SPEED ADJUST
BLOCK-DIAGRAM PILOTTONE SYNCHRONIZER
A80



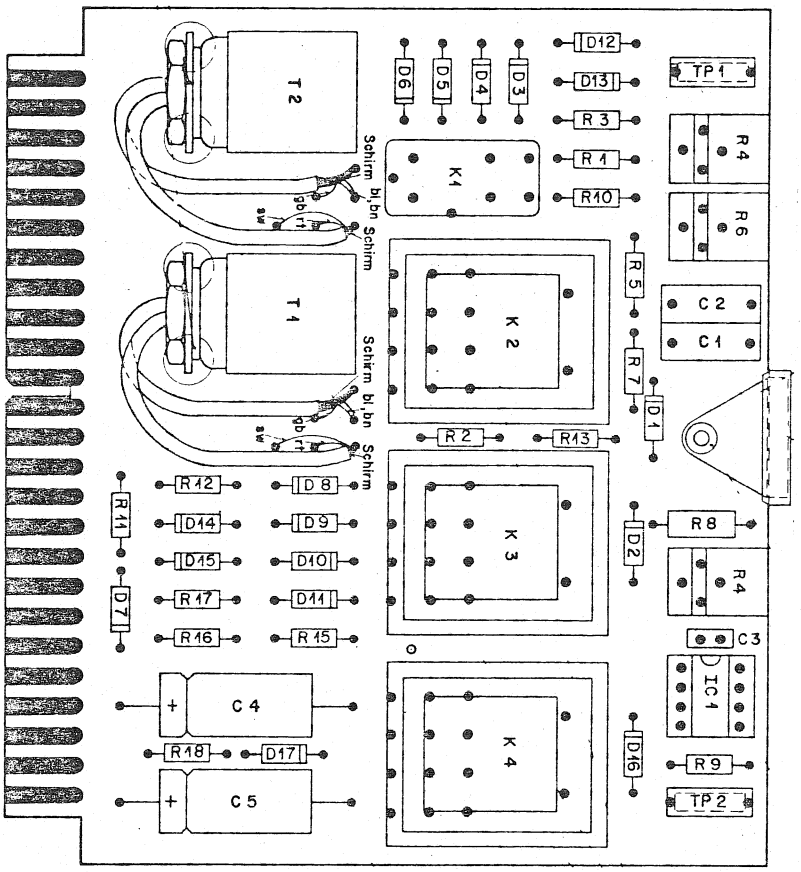
CABLE ARRANGEMENT
PILOT–TONE FOLLOW–UP SYSTEM A80/R 1.080.070 / 075


YBI-CON 1
YBI-CON 2
B-FEEDB
B-REF
B-COUNT
FEEDB.IN
Pilot Input
Y-TACHO
ON = Tacho
OFF = Tape
S1-TAC-1
Y-PRESS
REF. IN
Ref. Inp.
S2-MAN
Man. - Auto.
YAN-OUT
IC:
1 6 µA748
7 SN7493
8 SN74LS00
9 SN74123
10 SN7413
IC:
11 SN74LS04
12 SN74LS10
14 SN74193
15 SN4929
13, 16 SN74LS20
Dioden: 1N4448
7 div. 16
14 16 Bit up-down count.
50ns
+5V
-5.8V
+5.8V
0.0V
TP1
10K R-MAN-2
B-OVER
B-SYNC
Overflow
sync.



6.75 SCHEMATIC DIAGRAM

INPUT SELECTOR PRINT
1.080.909



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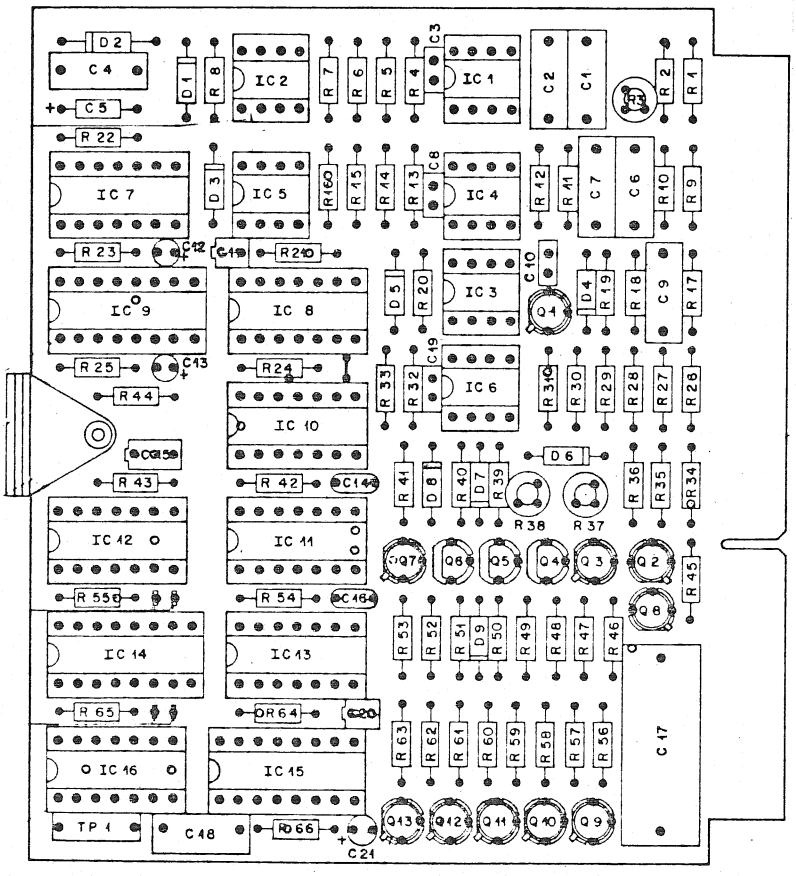

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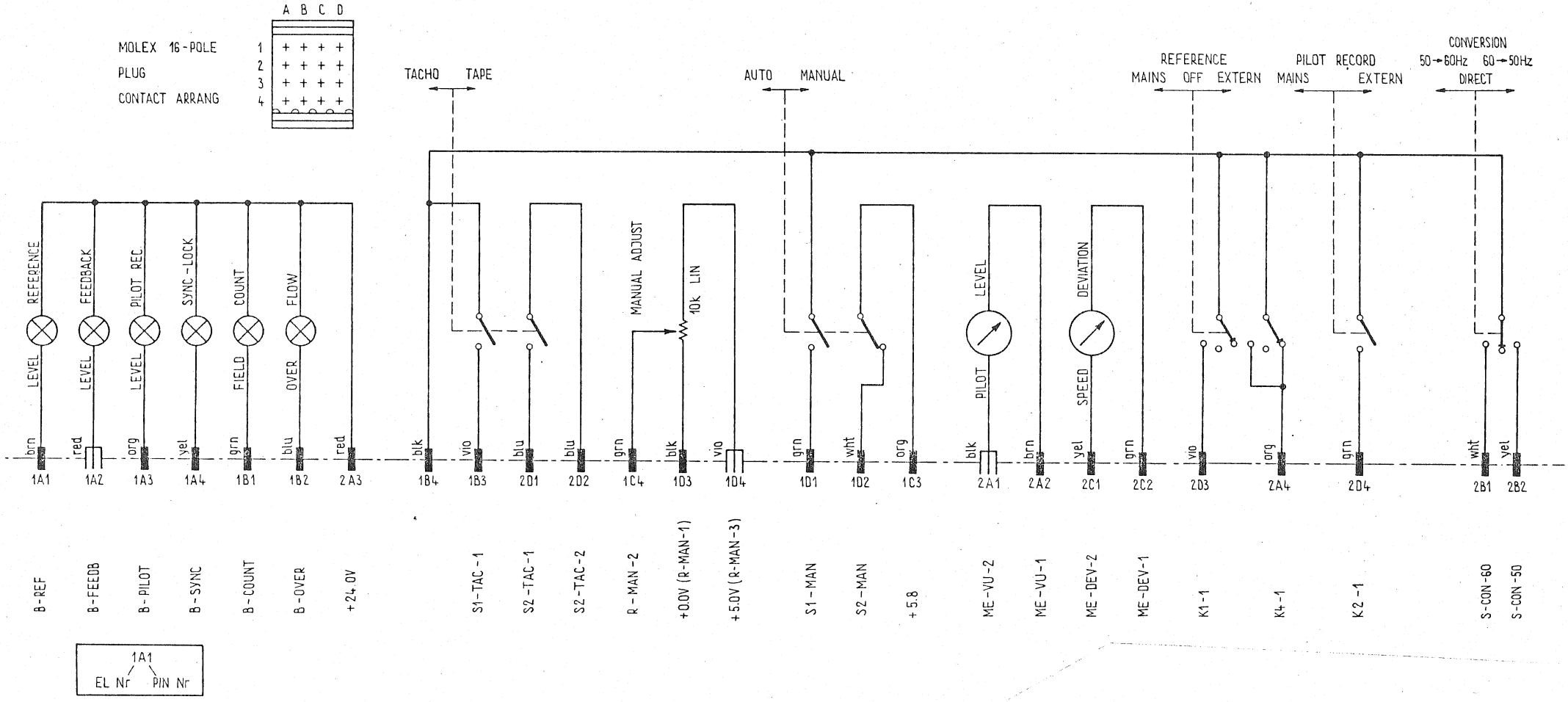
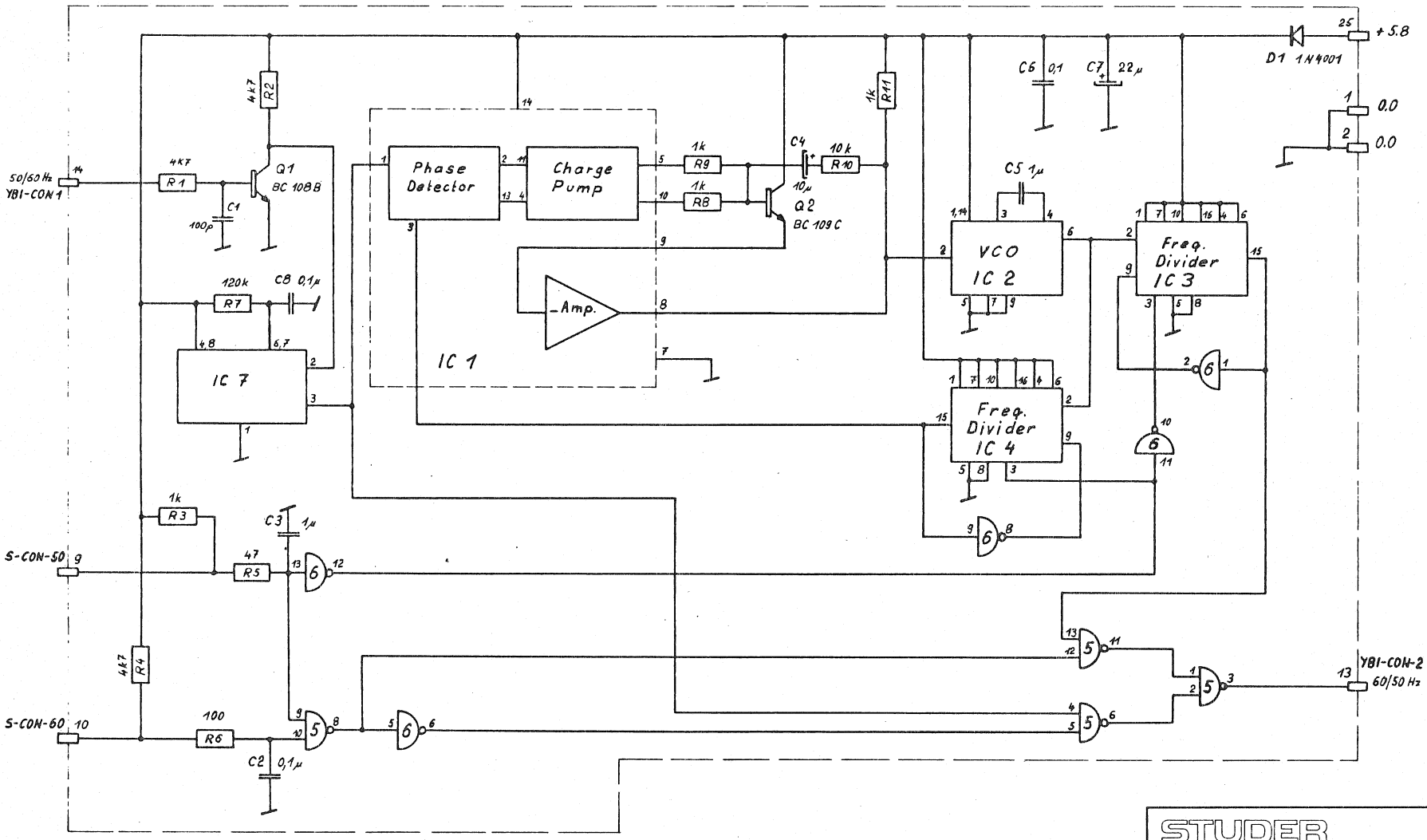


SCHEMATIC DIAGRAM
SYNCHRONIZER PANEL 1.080.910 / 1.080.915

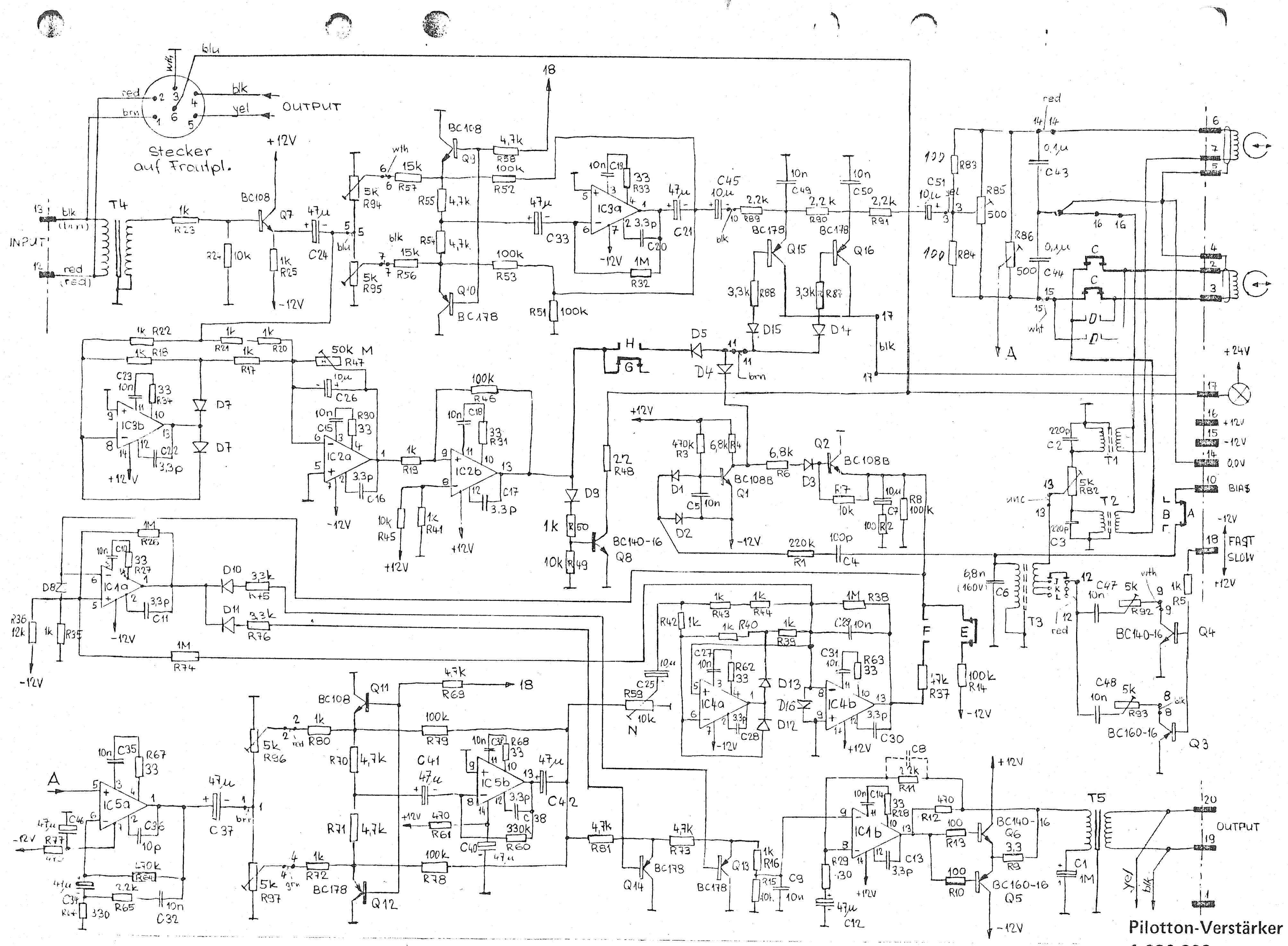


IC 1 MC 4044
2 MC 4024
3 SN 74LS 163
4 SN 74LS 163
5 SN 74LS 00
6 SN 74LS 04
7 NE 555 V

STUDER 1.080.919

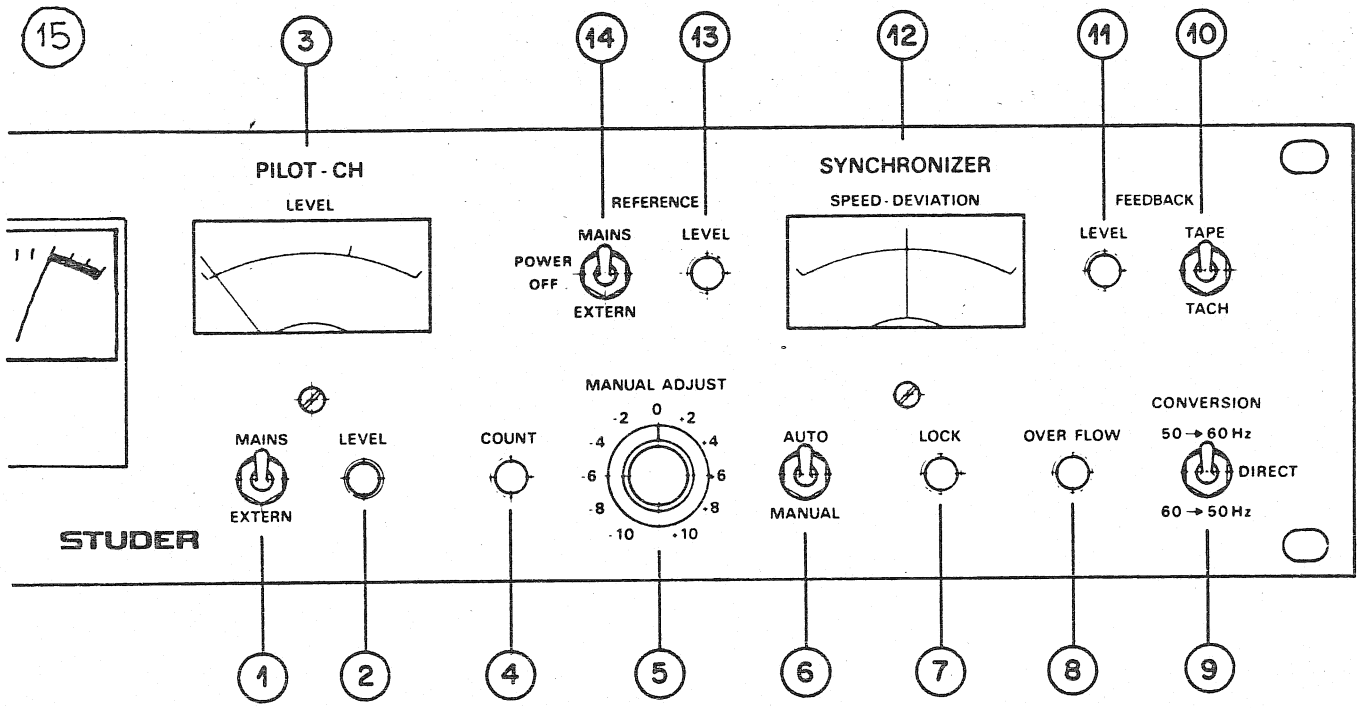
CONVERSION CIRCUIT 50/60 Hz

A 80 R ED 1 5.77



Pilotton-Verstärker
1.080.932

A80R PNVU - ERSATZTEILE - SPARE PARTS



1	SWITCH MAINS/EXTERN	55.01.0104
2	LAMP LEVEL INDICATOR YELLOW	53.04.0114
3	INSTRUMENT LEVEL PILOT CHANNEL (JEWELL)	1.080.910.15
4	LAMP COUNT INDICATOR WHITE	53.04.0119
5	POTENTIOMETER 10 K OHMS LIN. MANUAL ADJUST	1.080.910.08
	KNOB	42.01.0109
	COVER 42.01.0113	
6	SWITCH AUTO/MANUAL	55.01.0108
7	LAMP LOCK INDICATOR GREEN	53.04.0115
8	LAMP OVER FLOW RED	53.04.0112
9	SWITCH CONVERSION 50/60 Hz/ DIRECT	55.01.
10	SWITCH TAPE/TACH	55.01.0108
11	LAMP LEVEL INDICATOR YELLOW	53.04.0114
12	INSTRUMENT SYNCHRONIZER SPEED DEVIATION	1.080.910.16
13	LAMP LEVEL INDICATOR YELLOW	53.04.0114
14	SWITCH MAINS/EXTERN/POWER OFF	55.01.
15	INSTRUMENT AUDIO CHANNEL (MODUTEC)	89.01.0366

NACHSTEUERPANEL KOMPL. PNVU 1.080.915.00 07.06.79 EGLO-STI

AN	BEZEICHNUNG	AEND	B	BAUTEIL-NR.	VZ	CC	MENGE	ME
535.70	Z - SCHRAUBE, M 3 * 4		2	21.01.0352			2	STK
535.70	Z - SCHRAUBE, M 3 * 6		2	21.01.0354			4	STK
535.70	Z - SCHRAUBE, M 3 * 12		2	21.01.0357			2	STK
535.70	S - SCHRAUBE, M 3 * 5		2	21.01.2353			17	STK
535.70	S - SCHRAUBE, M 3 * 8		2	21.01.2355			2	STK
535.70	U-SCHEIBE D 5.3/ 10 *1.0		2	23.01.2053			6	STK
535.70	U-SCHEIBE D 3.2/ 9 *0.8		2	23.01.3032			4	STK
535.70	SICH.SCHEIBE D 3.2/5.5 *.45		2	24.16.1030			7	STK
535.70	FAECHERSCH.AZ D 5.3/ 10 *0.6		2	24.16.2050			2	STK
535.70	EINF.LOETOESE D 3.2/5.5 * 16		2	29.26.1023			1	STK
535.70	BEFESTIGUNGSRIEMEN 2.5 * 92		2	35.03.0109			6	STK
535.70	BEFEST.RIEMEN -OESE 4.9 * 197		2	35.03.0112			1	STK
535.70	DREHKNOPF GR, D 6.3/14.5		2	42.01.0109			3	STK
535.70	ABSCHLUSSDECKEL GR, ZU D 14.5		2	42.01.0113			3	STK
535.70	MUTTERABDECKUNG GRAU D 14,5		2	42.01.0133			3	STK
535.70	B 24 V ,.02A, MS 2.8		2	51.02.0137			6	STK
535.70	XB SUBMINIATUR RT		2	53.04.0112			1	STK
535.70	XB SUBMINIATUR GB		2	53.04.0114			3	STK
535.70	XB SUBMINIATUR GN		2	53.04.0115			1	STK
535.70	XB SUBMINIATUR GK		2	53.04.0119			1	STK
535.70	P GEHAUSE 16 POL MOLEX		2	54.02.0429			2	STK
535.70	S KIPP-, 1*ON-ON, AG		2	55.01.0104			4	STK
535.70	S KIPP-, 2*ON-ON, AG		2	55.01.0108			2	STK
535.70	S KIPP-, 2*ON-OFF-ON,		2	55.01.0109			1	STK
535.70	S KIPP-, 1*ON-OFF-ON, AG		2	55.01.0110			1	STK
535.70	R 10 K , 10%, .2 W , PCMA		2	58.10.9003			2	STK

NACHSTEUERPANEL KOMPL. PNVU 1.080.915.00 07.06.79 EGLO-STI

AN	BEZEICHNUNG	AEND	B	BAUTEIL-NR.	VZ	CC	MENGE	ME
535.70	VU-METER 2S- AV4- 000- AB		2	89.01.0366			1	STK
535.70	TELLERFEDER NI D 6.2/9.8 *0.2		1	1.010.001.37			8	STK
535.70	MUTTERBOLZEN M 3 X 10		1	1.010.021.27			4	STK
535.70	MUTTERBOLZEN M 3 X 15		1	1.010.023.27			2	STK
535.70	DISTANZSCHEIBE		1	1.080.530.08			4	STK
535.70	FEDER		2	1.080.910.03			4	STK
535.70	UNTERLAGE		1	1.080.910.04			1	STK
535.70	GEWINDEPLATTE		1	1.080.910.05			2	STK
535.70	FEDERANSCHLAG		1	1.080.910.06			4	STK
535.70	MOLEX-HALTER ZU PANEL		1	1.080.910.07			2	STK
535.70	POTENTIOMETER (NACHSTEUERPAN.) 10kΩ Lin.		1	1.080.910.08			1	STK
535.70	INSTRUMENT PEGEL		2	1.080.910.15			1	STK
535.70	INSTRUMENT ABWEICHUNG		2	1.080.910.16			1	STK
535.70	FRONTPLATTE PILOT-NACHSTEUER.		1	1.080.915.01			1	STK
535.70	BESCHRIFTUNGSPLATTE		1	1.080.915.03			1	STK
535.50	LI-L NACHSTEUERPANEL KOMPL.		1	1.080.915.93			1	STK
535.70	BEFESTIGUNGSWINKEL		1	1.080.950.03			2	STK
535.70	ANZEIGESCHEIBE		1	1.080.950.05			2	STK
535.70	BUECHSE		1	1.080.950.06			2	STK
535.70	U-SCHEIBE		1	1.080.950.07			8	STK
535.70	TELLERFEDER		1	1.080.950.08			4	STK
535.70	PANEL-ANSCHLUSSKABEL-MONO		1	1.080.954.00			1	STK
535.70	VU-METER-ANSCHLUSSPRINT		1	1.081.914.00			1	STK

	PILOT SYNCHRONIZER PRINT			1.080.908.00	3.12.75	
AN	BEZEICHNUNG	AENC	B	BAUTEIL-NR.	MENGE	ME
535 60	ROHRNIETE		2	28.21.1360	1	STK
535 50	Q BC 107B, NPN		2	50.03.0408	1	STK
535 50	Q BC 108B, NPN		2	50.03.0409	9	STK
535 50	Q SPF 323 BEZ.0442(2N 5485S		2	50.03.0442	3	STK
535 60	SPREIZ-UNTERLAGE TO 18/TO 5		2	50.03.9921	13	STK
535 50	D 1N 4448,AEQUIV., SI		2	50.04.0109	4	STK
535 50	D 1N 4001, SI		2	50.04.0122	1	STK
535 50	D 3.9 V, 5%, .40 W,Z,PLANAR		2	50.04.1101	3	STK
535 50	D 6.8 V, 5%, .40 W,Z,PLANAR		2	50.04.1102	1	STK
535 50	IC SN 7493N, TTL		2	50.05.0118	1	STK
535 50	IC SN 7413N,		2	50.05.0121	1	STK
535 50	IC SN 4929N, TTL		2	50.05.0126	1	STK
535 50	IC LM 301 AN 8P DIP		2	50.05.0144	6	STK
535 50	IC SN 74123N, TTL		2	50.05.0171	1	STK
535 50	IC SN 74 193 N		2	50.05.0174	1	STK
535 50	IC SN 74 LS 00 N TTL		2	50.06.0000	1	STK
535 50	IC SN 74 LS 04 N TTL		2	50.06.0004	1	STK
535 50	IC SN 74 LS 10 N TTL		2	50.06.0010	1	STK
535 50	IC SN 74 LS 20 N TTL		2	50.06.0020	2	STK
535 60	XIC DIL 8-POL		2	53.03.0166	6	STK
535 60	XIC DIL 14-POL		2	53.03.0167	7	STK
535 60	XIC DIL 16-POL		2	53.03.0168	3	STK
535 60	TESTBUCHSE SCHWARZ		2	54.01.0010	1	STK
535 60	KONTAKTSTIFT		2	54.01.0020	4	STK
535 60	BRUECKENSTECKER		2	54.01.0021	1	STK
535 50	R 100 , 10%, .25W , CMA		2	57.02.5101	1	STK
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	PILOT SYNCHRONIZER PRINT			1.080.908.00	3.12.75	
AN	BEZEICHNUNG	AENC	B	BAUTEIL-NR.	MENGE	ME
535 50	R 1.0 K , 10%, .25W , CMA		2	57.02.5102	9	STK
535 50	R 1.0 M , 10%, .25W , CMA		2	57.02.5105	2	STK
535 50	R 120 , 10%, .25W , CMA		2	57.02.5121	2	STK
535 50	R 1.2 K , 10%, .25W , CMA		2	57.02.5122	4	STK
535 50	R 15 K , 10%, .25W , CMA		2	57.02.5153	2	STK
535 50	R 150 K , 10%, .25W , CMA		2	57.02.5154	1	STK
535 50	R 1.8 K , 10%, .25W , CMA		2	57.02.5182	1	STK
535 50	R 22 K , 10%, .25W , CMA		2	57.02.5223	2	STK
535 50	R 220 K , 10%, .25W , CMA		2	57.02.5224	3	STK
535 50	R 2.7 K , 10%, .25W , CMA		2	57.02.5272	3	STK
535 50	R 27 K , 10%, .25W , CMA		2	57.02.5273	3	STK
535 50	R 3.3 K , 10%, .25W , CMA		2	57.02.5332	1	STK
535 50	R 390 , 10%, .25W , CMA		2	57.02.5391	4	STK
535 50	R 3.9 K , 10%, .25W , CMA		2	57.02.5392	1	STK
535 50	R 47 , 10%, .25W , CMA		2	57.02.5470	5	STK
535 50	R 4.7 K , 10%, .25W , CMA		2	57.02.5472	5	STK
535 50	R 470 K , 10%, .25W , CMA		2	57.02.5474	1	STK
535 50	R 680 , 10%, .25W , CMA		2	57.02.5681	2	STK
535 50	R 820 , 10%, .25W , CMA		2	57.02.5821	1	STK
535 50	R 8.2 K , 10%, .25W , CMA		2	57.02.5822	6	STK
535 50	R 82 K , 10%, .25W , CMA		2	57.02.5823	2	STK
535 50	R 1 K , 1%, 02.5 , MF		2	57.39.1001	1	STK
535 50	R 255 K , 1%, 02.5 , MF		2	57.39.2553	1	STK
535 60	R 1 K , 30%, .5 W , PMG		2	58.11.6102	2	STK
535 60	R 1 M , 30%, .5 W , PMG		2	58.11.6105	1	STK
535 50	C 150 N , 5%, 100V , MPC		2	59.02.2154	4	STK
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	PILOT SYNCHRONIZER PRINT		1.080.908.00	3.12.75
AN	BEZEICHNUNG AEND	B	BAUTEIL-NR.	MENGE	ME
535 50	C 6.8 U , 10%, 63V , MPC	2	59.05.1685	1	STK
535 50	C 100 N , 10%, 100V , MPC	2	59.05.2104	3	STK
535 50	C 2.2 U , 20%, 20V , TA	2	59.10.5229	2	STK
535 50	C 4.7 U ,-20%, 10V , TA	2	59.30.3479	2	STK
535 50	C 1 U ,-20%, 35V , TA	2	59.30.6109	1	STK
535 50	C 470 P , 10%, 500V , KER	2	59.32.1471	2	STK
535 50	C 10 N ,+80% 40=, KER	2	59.32.3103	1	STK
535 50	C 22 P , 5%, N150 , KER	2	59.34.2220	3	STK
535 50	C 10 U , 20%, 16V , TA	2	59.36.3100	1	STK
535 50	C 3.3 U , 20%, 10V , TA	2	59.99.0203	1	STK
535 60	GRIFF	2	1.010.001.33	1	STK
535 60	BEZEICHNUNGSSCHILD	2	1.080.908.01	1	STK
535 60	PRINT	2	1.080.908.12	1	STK

	INPUT SELECTOR PRINT		1.080.909.00	17.09.75	
AN	BEZEICHNUNG AEND	B	BAUTEIL-NR.	MENGE	ME
535 60	ROHRNIETE	2	28.21.1360	1	STK
535 50	D 1N 4448,AEQUIV., SI	2	50.04.0109	12	STK
535 50	D AAZ 18 , GE	2	50.04.0954	5	STK
535 50	IC LM 301 AN 8P DIP	2	50.05.0144	1	STK
535 60	XIC DIL 8-POL	2	53.03.0166	1	STK
535 60	TESTBUCHSE SCHWARZ	2	54.01.0010	1	STK
535 60	TESTBUCHSE ROT	2	54.01.0012	1	STK
535 60	K 24V-, .1 A, 1U , AU	2	56.02.1001	1	STK
535 60	K 24V=, .03 A, 4U, AU/AG	2	56.04.0120	3	STK
535 60	STAUBDECKEL	2	56.04.0122	3	STK
535 50	R 560 , 2%, .25W , MF	2	57.31.3561	1	STK
535 50	R 464 K , 1%, D2.5 , MF	2	57.39.4643	1	STK
535 60	R 100 , 5%, .25W , CSCH	2	57.41.4101	1	STK
535 60	R 22 , 5%, .25W , CSCH	2	57.41.4220	3	STK
535 60	R 2.2 K , 5%, .25W , CSCH	2	57.41.4222	3	STK
535 60	R 39 K , 5%, .25W , CSCH	2	57.41.4393	1	STK
535 60	R 470 , 5%, .25W , CSCH	2	57.41.4471	1	STK
535 60	R 47 K , 5%, .25W , CSCH	2	57.41.4473	1	STK
535 60	R 560 , 5%, .25W , CSCH	2	57.41.4561	1	STK
535 60	R 5.6 K , 5%, .25W , CSCH	2	57.41.4562	1	STK
535 60	R 56 K , 5%, .25W , CSCH	2	57.41.4563	1	STK
535 60	R 1 K , 10%, .5 W , PMG	2	58.01.3102	1	STK
535 60	R 10 K , 10%, .5 W , PMG	2	58.01.3103	2	STK
535 50	C 150 N , 5%, 100V , MPC	2	59.02.2154	2	STK
535 50	C 220 M ,-10%, 16V , EL	2	59.25.3221	2	STK
535 50	C 22 P , 5%, N150 , KER	2	59.34.2220	1	STK
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	INPUT SELECTOR PRINT		1.080.909.00	17.09.75	
AN	BEZEICHNUNG AEND	B	BAUTEIL-NR.	MENGE	ME
535 60	GRIFF	2	1.010.001.33	1	STK
535 50	AUFNAHME-EINGANGSTRAFO	2	1.062.770.03	2	STK
535 60	NUMMERNSCHILD	2	1.080.909.01	1	STK
535 60	INP.SELECTORPRINT	2	1.080.909.12	1	STK
535 60	HALTER	1	1.090.200.06	2	STK

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