SERVICE INFORMATION 56/80 e

A80/RC 2/2 P-FM
FM PILOT TONE

FM PILOT AMPLIFIER ADJUSTMENTS

(see layout drawing "Testpoints and controls)

1. F_O Adjustment of Record Amplifier:
   - Put a blank tape onto the machine
   - Insert jumpers I in A, II in B and III in B
   - Remove headblock cover and connect a frequency counter to the bridging wire between pin 8 and 20 of the pilot head connector.
   - Start the recorder in record mode and adjust R26 to obtain a frequency of 13,5 kHz or 17 kHz as applicable.

2. Checking ΔF of Record Amplifier:
   - Insert all jumpers in position B
   - Start the recorder in record mode and measure the voltage on TP S with a voltmeter having at least 40'000 Ohms/Volt. If required adjust P1 for - 1 Volt on TP S. The frequency should now be F_O + 18 % to + 22 %.

3. Checking Fo of Demodulator:
   - Insert jumper I in A and jumpers II and III in B
   - Start the recorder in record mode and measure the voltage at TP 5 with a voltmeter (40'000 Ohms/Volt).
   - If neccessary adjust R17 to obtain - 4,25 Volt $\pm$ 0,1 Volt at TP 5.
   - With the machine still in record mode, feed a 50 Hz (60 Hz) Pilot signal of 1,41 Volt into the pilot input and adjust R39 to obtain 0 Volt at TP 9. (This adjustment is only required if the DC CUE output is being used).

4. Output Level Adjustment:
   - Insert I in A and jumpers II and III in B
   - Connect an AC voltmeter to the pilot output
   - Feed a 50 Hz (60 Hz) signal of 1 Volt RMS into the pilot input.
   - Start the recorder in record mode and if neccessary adjust R42 to obtain an output level of 1 Volt.

5. Head Azimuth Adjustment:

   - Insert all jumpers in position A
   - Thread a 12-15 kHz fulltrack recorded test tape.
   - Start the machine in reproduce mode and adjust the pilot head azimuth for maximum level at TP 1 using an AC VTVM.

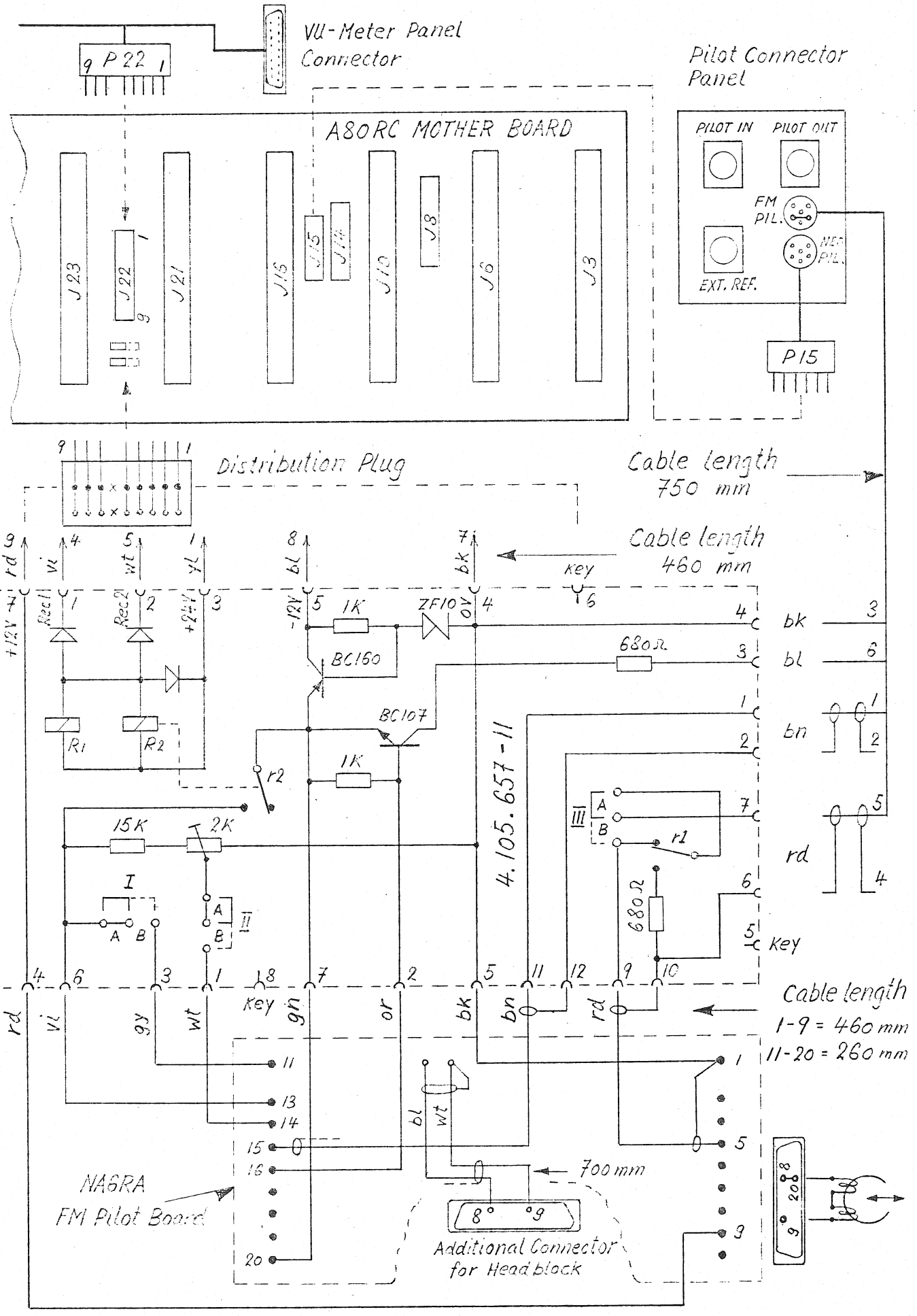
6. Threshold level of pilot indicator:

   - Connect a lamp (12 V $\leq$ 50 mA) between pins 3 and 6 of the pilot input/output socket.
   - Apply a 50 Hz (60 Hz) signal to the pilot input. Increase the voltage until the lamp lights up, which should occur at a level of 0,4 Volts. The mode of operation of the tape transport is irrelevant for this test.

7. Record Reproduce Overall Check:

   - Insert all jumpers in position A
   - Thread a blank tape
   - Apply 50 Hz (60 Hz) 1 Volt to the pilot input
   - Start the machine in record mode, and record a stretch of tape. There must be no output at the pilot output during this time.
   - Rewind the recorded stretch of tape and play it back. The output level should now be equal to the applied input level.

Regensdorf, 3.10.1980 To/js



23.9.80	Thomsen	FM-PILOT WIRING	
STUDER	A80 RC-2/2 P-FM		PAGE OF

INTERFACE BOARD LAYOUT

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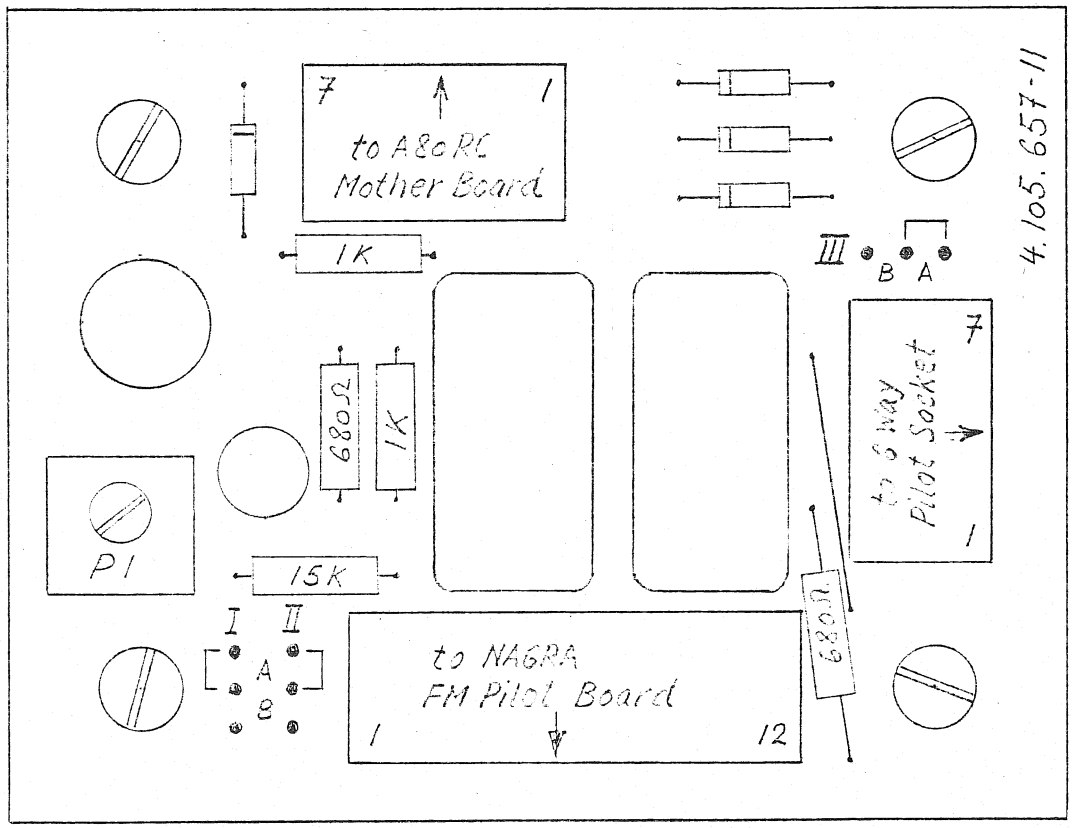
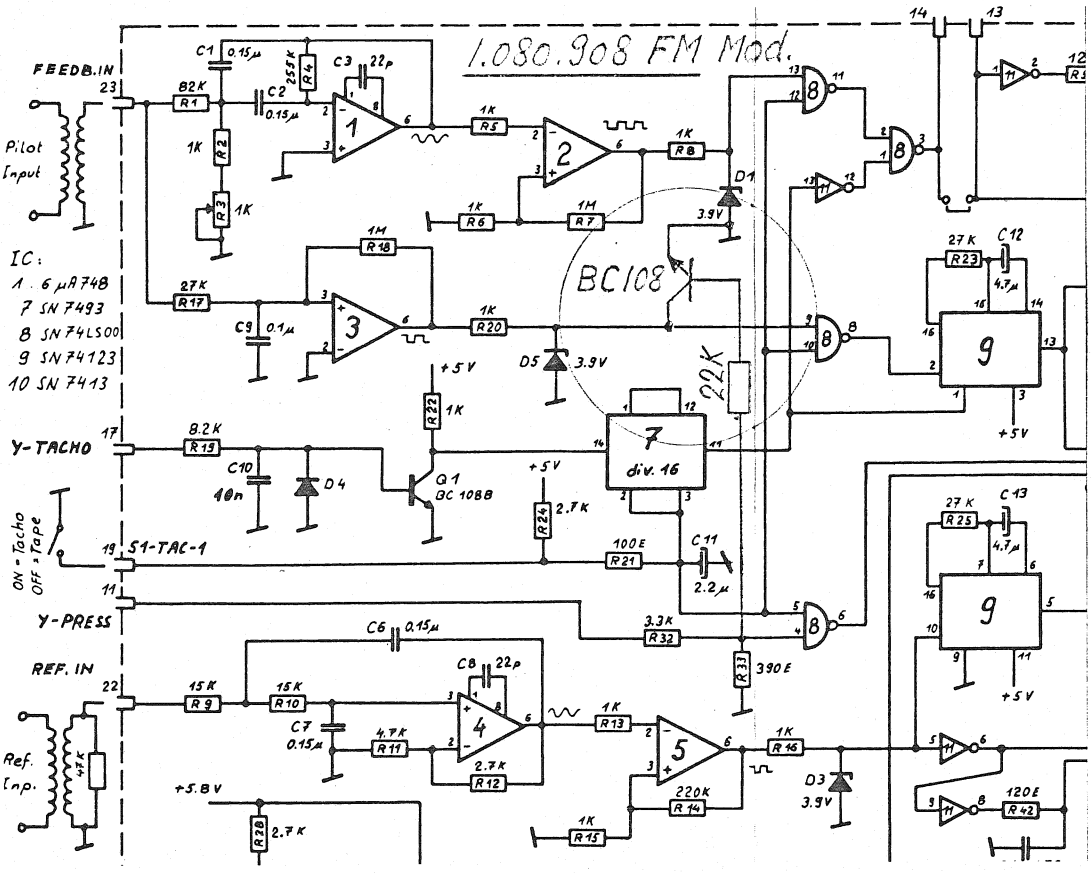
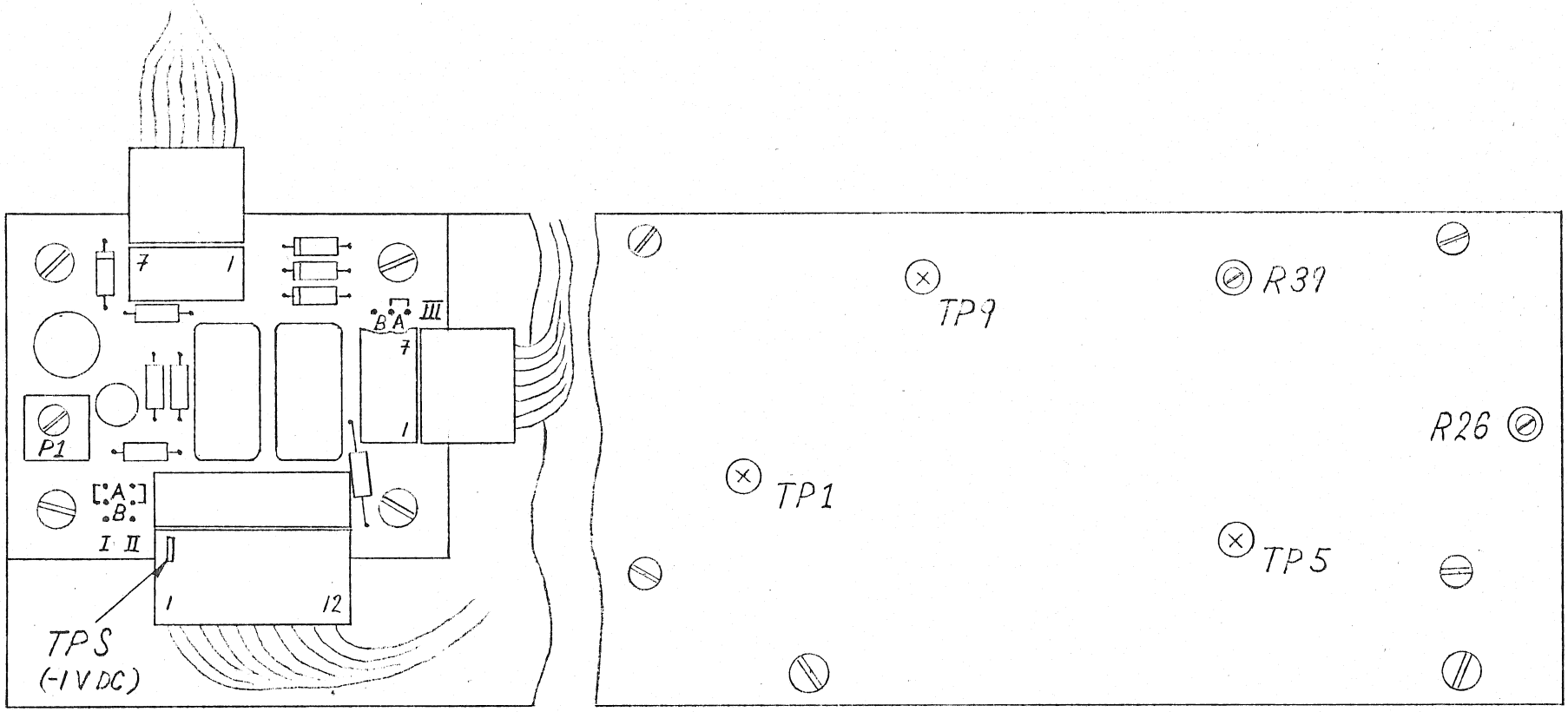
10.022.104.01



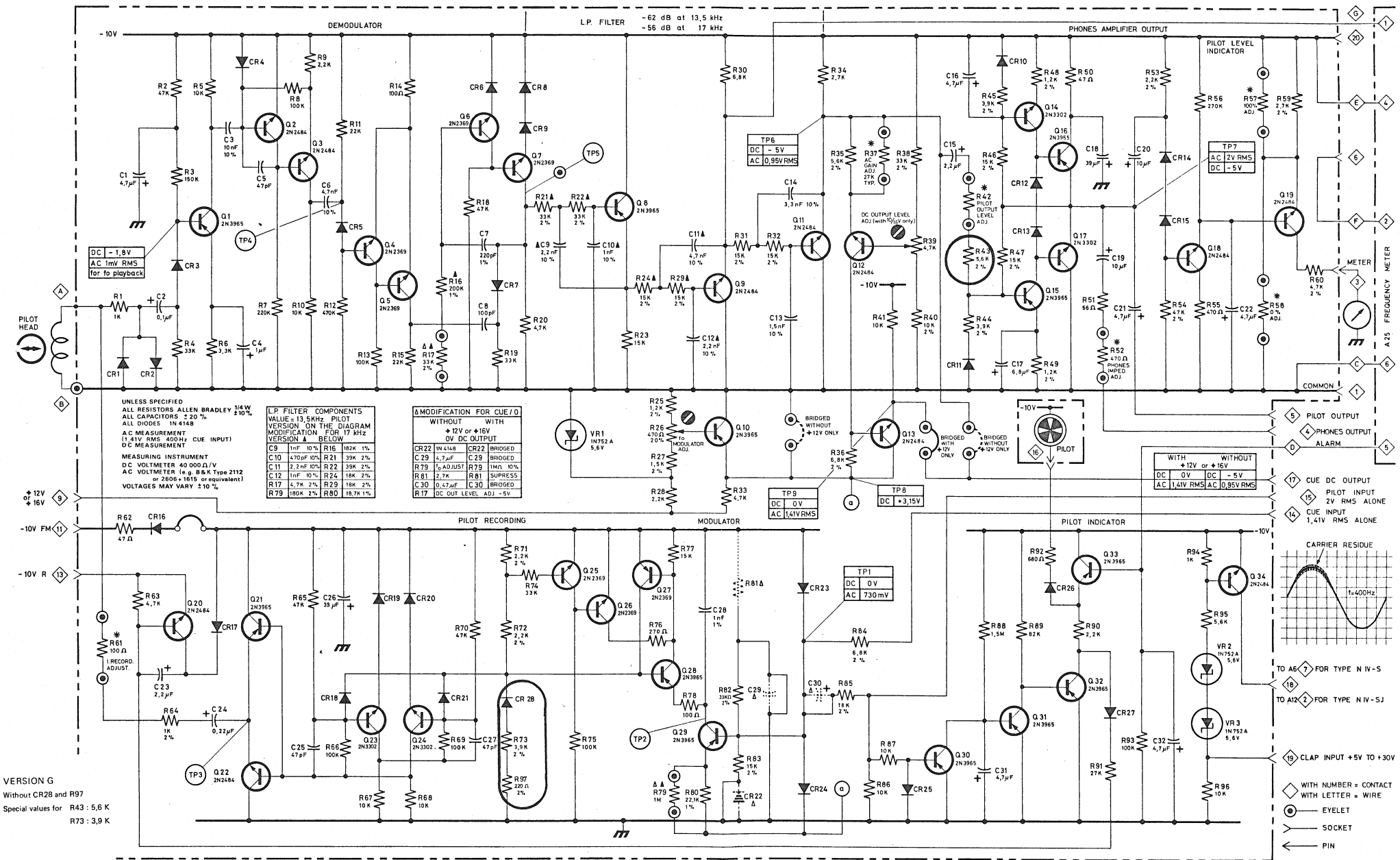


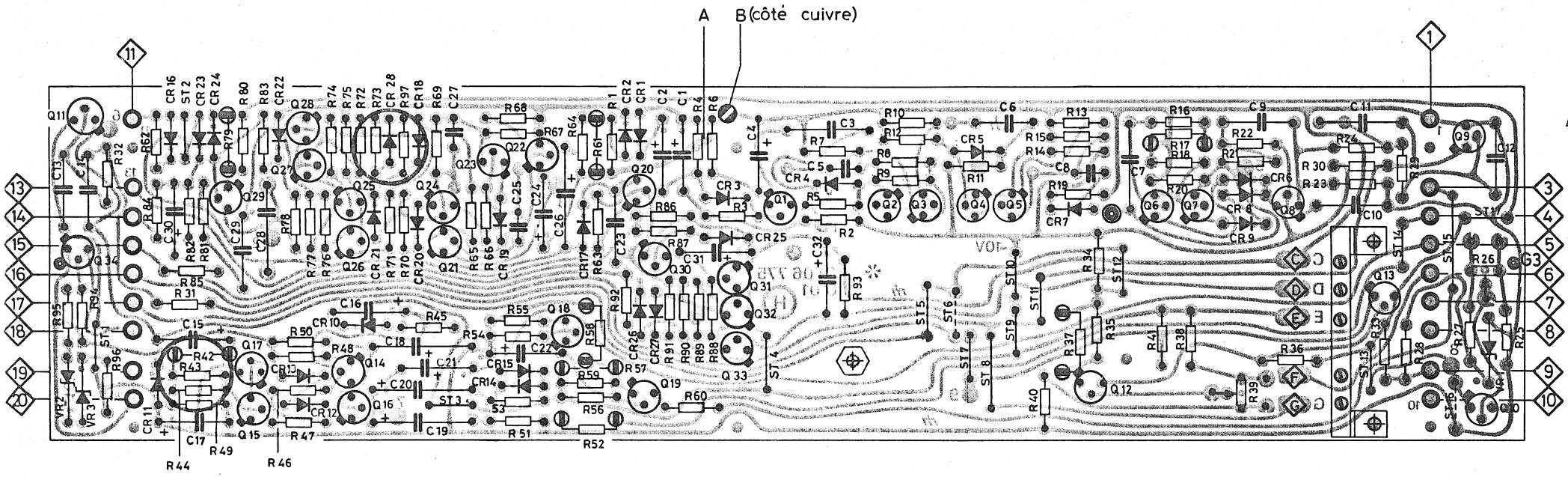
23.9.80	Hamsen	FM Pilot Interface & 1.080.908 Mod.		
STUDER	A80 RC 2/2 P-FM			PAGE OF



Testpoints and Controls

A24


DEMODULATOR
L.P. FILTER
-62 dB at 13,5 kHz
-56 dB at 17 kHz
PHONES AMPLIFIER OUTPUT
PILOT LEVEL INDICATOR
PILOT HEAD
PILOT RECORDING
MODULATOR
PILOT INDICATOR
A25 FREQUENCY METER
METER
COMMON
PILOT
PILOT OUTPUT
PHONES OUTPUT
ALARM
CUE DC OUTPUT
PILOT INPUT 2V RMS ALONE
CUE INPUT 1,41V RMS ALONE
CARRIER RESIDUE
f=400Hz
CLAP INPUT +5V TO +30V
WITH NUMBER = CONTACT
WITH LETTER = WIRE
EYELET
SOCKET
PIN
OPTIMUM VALUE TO BE SELECTED
TYPICAL VALUE SHOWN
DC - 1,8V
AC 1mV RMS
for fo playback
TP6
DC - 5V
AC 0,95V RMS
TP7
AC 2V RMS
DC - 5V
TP1
DC 0V
AC 730mV
TP8
DC +3,15V
TP9
DC 0V
AC 1,41V RMS
WITH +12V or +16V
DC 0V
AC 1,41V RMS
WITHOUT
DC - 5V
AC 0,95V RMS
UNLESS SPECIFIED
ALL RESISTORS ALLEN BRADLEY 1/4 W ±10 %
ALL CAPACITORS ± 20 %
ALL DIODES 1N 4148
AC MEASUREMENT (1,41V RMS 400 Hz CUE INPUT)
DC MEASUREMENT
MEASURING INSTRUMENT
DC VOLTMETER 40 000 Ω/V
AC VOLTMETER (e.g. B&K Type 2112 or 2606 + 1615 or equivalent)
VOLTAGES MAY VARY ± 10 %
L.P. FILTER COMPONENTS VALUE = 13,5KHz PILOT VERSION ON THE DIAGRAM MODIFICATION FOR 17 kHz
VERSION Δ BELOW
C9 1nF 10% R16 182K 1%
C10 470pF 10% R21 39K 2%
C11 2,2nF 10% R22 39K 2%
C12 1nF 10% R24 18K 2%
R17 4,7K 2% R29 18K 2%
R79 180K 2% R80 18,7K 1%
Δ MODIFICATION FOR CUE / O
WITHOUT WITH +12V or +16V 0V DC OUTPUT
CR22 IN 4148 CR22 BRIDGED
C 29 4,7 µF C 29 BRIDGED
R 79 fo ADJUST. R 79 1MΩ 10%
R 81 2,7K R 81 SUPRESS
C 30 0,47 µF C 30 BRIDGED
R 17 DC OUT LEVEL ADJ. - 5V
VERSION G
Without CR28 and R97
Special values for R43 : 5,6 K
R73 : 3,9 K
VERSION H
Modulator and Demodulator Adjusments
Remark: all adjustments with modulator ON obtained by connecting -10 FM to -10 G on the Cue receptacle.
Adjustments 0V Cue DC output (+12 or +16V QSJC supplied)
1. Adjust modulator frequency fo at 17 or 13,5 kHz ± 0,5% with R 26, without signal at input terminals.
2. Adjust demodulator output level with R 37 at 1,41 VRMS ± 0,5 dB for Δf/fo = ± 40% (1,41 VRMS 400 Hz on Cue input).
3. Without input signal, adjust R 39 for 0V DC Cue output
Warning: demodulator DC output level depends on fo adjustment (R 26).
Adjustments without 0V Cue DC output (without QSJC)
1. Adjust modulator frequency fo at 17 or 13,5 kHz ± 1% with R 79
2. Adjust Cue DC output for -5V ± 0,1 V with R 17 without input signal
3. Check demodulator output level of 0,95 VRMS ± 1 dB for Δf/fo = ± 40% (1,41 VRMS 400 Hz on Cue input).
TP2 10 µs / DIV. -9,1 V -4,5 V 1V/DIV. 0V
TP3 10 µs / DIV. -8 V 1V/DIV. 0V
TP4 10 µs / DIV. 12,2V -5V 2V/DIV. 0V
TP5 10 µs / DIV. 6,8V 2V/DIV. 0V
DIAGRAM FOR fo = 13,5 kHz
KUDELSKI S.A. Dept NAGRA CH 1033 CHESEAUX Switzerland
NAGRA MAGNETIC RECORDERS INC. NEW YORK, N.Y. 10036 19 West 44 th Street
A 24
NAGRA IV-S/SJ 09.06.775.000 24.11.76
PILOT
WITH 0V DC INPUT AND OUTPUT
This drawing is confidential and may not be divulged in whole or in part to a third party



VERSION G

Without CR28 and R97

Special values for R43

R73

10.3S2.200.00

NAGRA IV-S

PILOT WITH OV DC INPUT AND OUTPUT

VERSION H