10. Circuitry Description

The circuitry of the basic instrument consists of the following units:

- Main Board - Unit 1
- Front Panel - Unit 2
- Remote Interfaces
- Power Supply

The functionality of the circuitry contained in the detailed block diagram is described below.

10.1 Main Board - Unit 1

10.1.1 Signal Switches

The Signal Switches (RE101 - 104) are of the two coil latching type. This means that the relays are bistable and that the contact position will not change after a power-down. Each coil has its own Switch Driver (Q101 - 108). Surge suppression is handled by diodes (D101 - 108). All the signal relays in both the basic instrument and in the optional units will switch simultaneously, controlled by RESET_REL or SET_REL control signals. These control signals are buffered in the V101 buffer.

10.1.2 Relay Memories

The following parameters of the instrument mode are preserved even after a power-down:

- the Manual/Auto control selection
- the Primary/Secondary generator selection
- which sync source generator is actually "On air"
- the Remote Enable/Disable

These parameters are thus stored in two-coil Latching Relays (RE201 - 203 and RE205). These relays are driven by Relay Drivers (Q201 - 210) and surge suppression is handled by diodes (D201 - 210). Monostables (V203, V204, V206, and V209) ensure a drive pulse long enough to energize the relay coils for a safe switch action. To prevent both coils in a relay from being energized simultaneously, only one monostable per relay can be active at a time. This is controlled by Flip-flops (V210 and V212) clocked by the CLOCK2 signal.

10.1.3 Clock Generator and Power Watchdog

The Master Clock signal of the instrument is approximately 200Hz and generated in V14. Two Clock Signals (CLOCK1 and CLOCK2) are used by the Source Error Logic, the Relay Memories and in the TTL input.

Special precautions are taken in order to prevent false relay switching during power-up and -down. A Watchdog circuit (V17) supervise the +5V supply and generates a 50ms power reset pulse (POW_RES) if the +5V deviates from the nominal voltage. This pulse disables the Master Clock signal and clears the monostables.

10.1.4 Source Error Logic

The Sync Signal Detectors are all located in the PT 5210 VariTime™ Digital Sync Generators. The PT 5211 receives a fault signal from a sync generator if its sync signals fall outside certain limits. The fault signals are buffered in V6 and clocked by the Master Clock signal (CLOCK1) in V8. The fault signals are used in the Source Shift logic.

If a fault signal is received, an alarm signal is generated in V7 and V13 and the Audio Beeper on the Front Panel may be activated by transistor Q1. The alarm signal is also stored in V12. When an alarm goes on the coil of the Alarm Relay (RE204) will de-energize and the relay contacts close.

Access to the Alarm Relay is via the Alarm Output of the TTL socket. During power-down the Alarm Relay contacts are also closed indicating an "Alarm" situation.

10.1.5 Source Shift Logic

The fault signals from the sync generators, the selection of primary/secondary generator, and information specifying which generator is actually "On air" - all this information is taken into consideration when the Logic Circuitry (V6-7, V10-11, and V15) decides whether or not a changeover should take place.

Only in AUTO mode can an automatic changeover take place on the command of incoming fault signals. In MANUAL mode, which can be selected either from the Front Panel or via TTL Input, changeover can only take place after a "manual" command. V16 is the Man/Auto Selector.

10.2 Front Panel - Unit 2

The six pushbuttons (S501 to 506) necessary for local operation of the instrument are located on the Front Panel.

The mode of the instrument can only be modified by pushing the S501 ("HOLD TO MODIFY") together with one of the other buttons (S502 - 506).

The mode of the PT 5211 is indicated by the 11 LEDs on the Front Panel plate. 5 of the LEDs are integrated in the pushbuttons. The V501 and V502 are the LED Drivers, although not for the "POWER ON" LED, which is connected directly to the +5V power supply.

10.3 Interfaces

The PT 5211 can respond to a signal fault condition. The instrument is connected to fault detectors in two PT 5210 sync generators.

From the PT 5211 can the Front Panel be set into a "Remote Enable" mode. Then the instrument may be remote controlled and information of the mode can be present at remote.

The instrument has two interfaces:
- a PT 5210 interface ("PT 5210 1/2")
- a TTL remote interface ("REMOTE")

The circuit boards are located just behind the In- and Output connectors on the Rear Panel and serve as EMI protection of the instrument.

Every control signal In- and Output passes an LC Low-pass Filter.

10.4 Options

10.4.1 PT 8617 - BNC Channels

The PT 8617 BNC option is designed very much the same way as the BNC signal switches in the basic instrument.

Signal Switches (RE301 - 302) are of the two-coil latching type. This means that the relays are bistable and that the contact position will not change after a power-down. Each coil has its own Switch Driver (Q301 - 304). Surge suppression is handled by diodes D301 - 304. All the Signal Relays in both the basic instrument and in the optional units will switch simultaneously, controlled by RESET_REL or SET_REL control signals. These control signals are buffered in the V301 buffer.

10.4.2 PT 8618 - XLR Channels

The PT 8618 XLR option is capable of switching AES/EBU digital audio signals. Since these signals are normally balanced, two sets of relay switches are needed per signal to be switched.

Signal Switches (RE401 and RE404) are of the two-coil latching type. This means that the relays are bistable and that the contact position will not change after a power-down. Each coil has its own Switch Driver (Q401 to 408). Surge suppression is handled by the diodes D401 to 408.

All the Signal Relays in the basic instrument, in the PT 8617 option, and in this optional unit will switch simultaneously, controlled by RESET_REL or the SET_REL control signals. These control signals are buffered in the V401 buffer.

The PT 8618 is equipped with standard XLR connectors in the signal outputs and with 9-pole sub-D connectors to interface with PT 5210 VariTime™ Digital Sync Generator's digital audio output ("AES/EBU AUDIO") or time code output ("TIME CODE"). The digital audio output conforms with the AES/EBU standard for digital audio signal distribution.