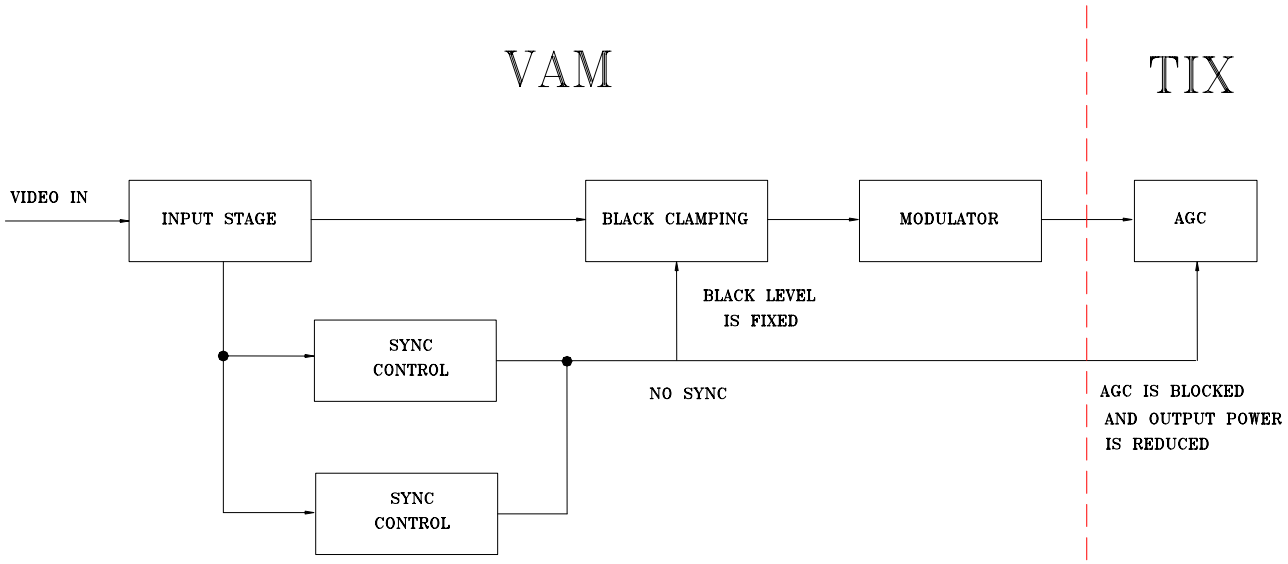
UPGRADES ON THE ITEL TV TRANSMITTERS

Critical Upgrades

Modification of the Video Processor in the VAM Video Modulator

We have add a board that verify with more accuracy the quality of the video signal that input the modulator.
There may be a problem when the video signal is very poor in quality or is switching on and off continuously or is a signal that is not in the standard accepted by the modulator. If the circuit that control the synchronism doesn't recognise it as a fake signal and continue to use the extracted synchronism to do the black clamping, due to a not correct Blank Clamping, we may have same fluctuation in the drive power or short peaks that can damage the RF transistors.
In order to reduce this event we have modified the circuit that control the synchronism.
Obviously it continues to be absolutely not recommended to connect or disconnect the video signal while the transmitter is on air.



→ Reduction of power fluctuation and presence of peaks due to:

- poor video signal
- video signal input on-off toggle
- connection and disconnection of the video input cable
- input of an incorrect signal

We will provide you the new video processor board and all the instructions to substitute it.

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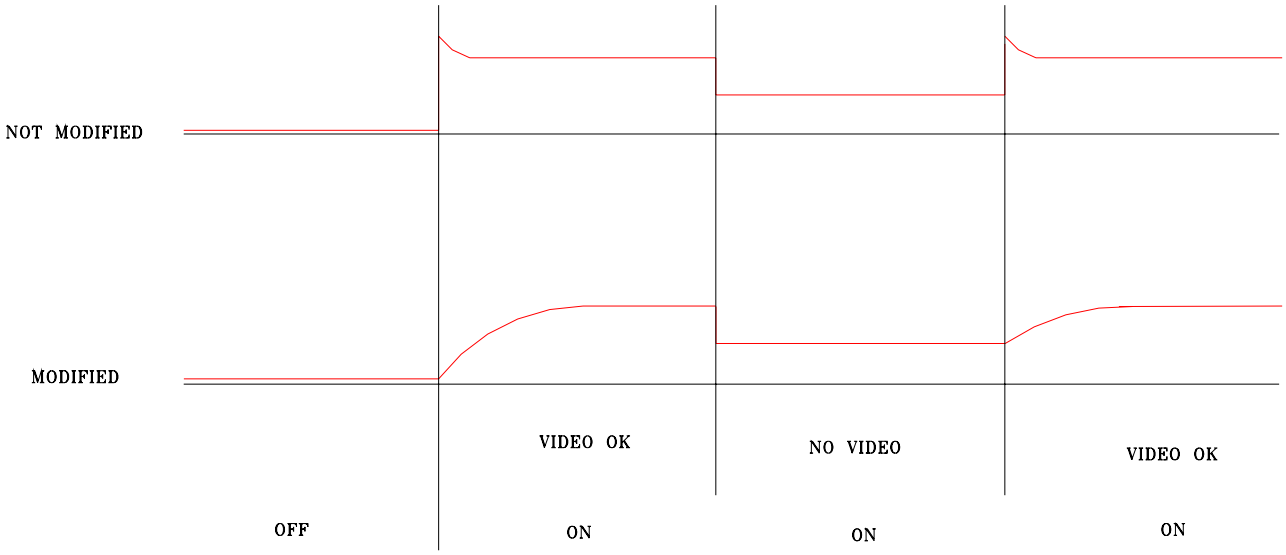
Modification of the IF to Channel Converter (TIX)

✓ First point:

We modified the output amplifier so that, when the equipment is powered up or, more precisely, when the IF signal starts to feed the TIX, the output power doesn't grow up immediately to the value fixed by the RF LEV ADJ trimmer but it takes about 30-60 seconds (soft start) to reach the final value.
We modified the Automatic Gain Control system so that, when the power output is reduced due to an absence of video input and returns at the correct level when the video returns, the changes in power are done gradually (a few milliseconds) without creating peaks.
The output power is shuted down even when something happens that cause the PLL unlock: after the lock of the PLL the output power starts to increase gradually.



→ Reduction of the peaks due to:
- repetitive switching on and off the transmitter
- video signal input on-off toggle

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✓ **Second point:**

We modified the Automatic Gain Control system so that changes in the operating temperature of the equipment give a very small variation of the output power.

Temperature	Output Power without Compensation (dBm)	Output Power with Compensation (dBm)
- 5 °C	- 4.5	- 4.5
0 °C	- 4.6	- 4.5
+ 10 °C	- 5.0	- 4.6
+ 20 °C	- 5.1	- 4.7
+ 30 °C	- 5.4	- 4.8
+ 40 °C	- 5.7	- 4.9
+ 50 °C	- 6.0	- 4.9

Max variation of the output power	1.5 dB	0.4 dB

→ Reduction of the power drift due to:
- temperature variations during the day
- temperature increasing during power up

We will provide you the new TIX module and all the instructions to substitute it.

Other Upgrades

Protection Board

We have changed the functioning method of the protection board especially regarding the Overdrive.

Before: - the protection was made reducing the polarization point of the driver module in the final amplifiers.
- we measured the **output** power and when it reached a fixed threshold, there was the shut down of the driver module and consequently of all the amplifiers (overdrive).

Now: - the protection is made reducing the polarization point of all the modules in the final amplifiers.
- we measure the **input** power and when it reaches a fixed threshold we shut down all the modules of the amplifier (overdrive).
- the transistors are not polarized until the input power reaches a fixed value for a sufficient period (squelch).

→ Improvement of the protection against overdrive and input peaks at power up

We have improved also the protection against reflected power and temperature, but they act substantially as before.

You will find this new feature in your next ITEL equipment

Power Supply

We have decided not to buy any more the power supply units from the Supplier we had a few years ago because of the repetitive problems we encountered. Now we prefer to build the power supply unit by our own, more fitted to our specific usage in broadcasting.
Now we can have more performing and more reliable equipments.

→ Improvement of reliability of the power supply

You will find this new feature in your next ITEL equipment.

Thermal compensation in the amplifier module

We modified the compensation for a temperature drift in each power modules. The power module has been redesigned in order to reduce the power drift. All the other features remain the same.

Before: (example in a 1000W transmitter)

Time from power-up (min)	Output Power (Wrms)	Output Power (Wps)
0	588	1050
1	515	920
2	487	870
3	487	870
4	487	870
6	487	870
60	487	870

Max variation of the output power	0.8 dB	0.8 dB

Now: (example in a 1000W transmitter)

Time from power-up (min)	Output Power (Wrms)	Output Power (Wps)
0	616	1100
1	613	1095
2	610	1090
3	610	1090
4	610	1090
6	610	1090
60	613	1095

Max variation of the output power	0.2 dB	0.2 dB

→ Reduction of the power drift due to:
- temperature variations during the day
- temperature variation after power up

You will find this new feature in your next ITEL equipment and in the spare parts we will eventually send to you.

Next Upgrades

Protection and Measures Board

- Instead of giving only the voltage of the 2 power supplies and the current they supply (Vpa1, Ipa1 = $I_{module1} + I_{module2} + I_{module3} + I_{driver}$, Vpa2 and Ipa2 = $I_{module1} + I_{module2} + I_{module3}$), now with the new measures board we will be able to measure the voltage and the current of the driver and of each power module independently in the final amplifier.
- We will improve the precision of the measures of temperature and of direct, reflected and driver power in order to have a more correct indication and a more reliable protection.
- We will introduce an automatic compensation of the measures and protection in case of change of the transmitting frequency to make this operation easier.

Equipment control logic

- We will introduce a control logic dedicated to the start up procedure and to the protection of the transmitting equipment.
- A 485 data bus will connect together all the components of the transmitter and the control logic to make possible the data exchange necessary for the protection and for the visualization locally or remotely of measures and alarms.