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A HUNGARIAN - AMERICAN LTD. COMPANY FOR MANUFACTURE AND SALES OF CABLE TV EQUIPMENT

CW-3000 PROFESSIONAL PROGRAMMABLE MULTISTANDARD CABLE TV HEADEND

USER'S GUIDE

TV MODULATOR

CW-315x
CW-316x
CW-317x

3

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MECHANICAL CONSTRUCTION

The **TV MODULATOR** is mounted in a standard 1-module high 19-inch rack case according to the modular rack system.

Accessories		qty
1.	Feet for the unit	4
2.	Fuses T0.4A	1
	M0.63A	1

Do not use feet when mounted in a rack cabinet.

In the rack the **TV MODULATOR** should be put just under a receiver and the two units together form a complete channel processor. To maintain proper cooling, vented cover plates should be mounted among the separate channel processing pairs (every third place).

In case of individual usage push the feet into the holes at the 4 corners of the underplate. When a unit is put on another, feet prevent slipping.

For changing the fuses or removing the feet, undo the fixing screws and lift the top cover.

ELECTRICAL CONSTRUCTION

In the **TV MODULATOR** the IF carrier is modulated by the baseband video- and sound signals, then the vestigial side-band characteristics are formed and the signal is transposed into the 48...860 MHz frequency band.

The input and output connectors can be found on the back panel of the unit as follows:

qty,	type
1	BNC socket (video input)
2	RCA sockets (sound inputs)
1	F socket (RF MAIN OUTPUT)
1	F socket (**RF TEST OUTPUT**, for test purposes. The level is 22 dB lower, than the level of the **RF MAIN OUTPUT**.)

Option 1

A looped video input can be made by removing the 75-ohm terminating resistor from the modulator PCB and mounting a **'VIDEO OUT'** BNC socket on the back panel. When this output is not used, the enclosed 75-ohm BNC terminator should be connected.

Option 2

Different encoders (e.g. HBO) and automatic controls can be connected into the signal flow. The signal flow is disconnected and the connection can be accomplished through the 2 F-type sockets (**IF IN, IF OUT**) of the back panel.

The operational characteristics and signal levels are displayed by the LED indicators on the front panel. See detailed description in chapter titled *'PROGRAMMING'* .

If the levels of the input video and sound signals differ from the nominal values, the modulation depth and deviation can be adjusted by trimmers through the holes of the front panel.

The instant characteristics of the sound are indicated by the left-hand LED-line. The first yellow LED (**SC OFF**) will be flashing, when the sound carrier is switced off. The next six LEDs indicate the volume of the frequency deviation of the sound carrier. The last, red LED (**OVERMOD**) will light up at 10 % overmodulation in relation to the 50 kHz deviation (i.e. 55 kHz).

The sound deviation, the input sensitivity can be adjusted by the front panel potentiometer (**DEVIATION**), in a wide range of the input signal (from +6 dBm / ±30 kHz to -6 dBm / ±50 kHz).

The nominal factory value is 0 dBm / ± 50 kHz.

The right-hand LED line indicates the characteristics of the video modulation. The first, yellow LED (**DC REST**) informs about the clamper mode (see detailed description later in chapter titled *'PROGRAMMING'*).

The second, green LED (**SYNC**) will light, when there is synchron signal. The next LEDs indicate the video modulation depth. The last, red LED (**WHCL**) will flash, when the white-clipper circuit is in action.

The input sensitivity can be adjusted by the front panel potentiometer (**MOD%**) for 1 V_{pp} ±3 dB input level range.

The nominal factory value is 1 V_{pp} / 87.5 %.

The standard **TV MODULATOR** uses unbalanced sound input, with resistance of min. 10 kohms. But it can be turned into 600 ohm balanced input. To accomplish this, break jumper between points 2-3 and solder 1-2 of switch S201 on the **CW-3100 IF MODULATOR VIDEO & SOUND UNIT** panel. The input frequency-deviation sensitivity will not change.

The two inputs are connected in parallel and are equivalent for use. The possibility for looped inputs is also provided.

The basic building blocks of the unit are as follows: power supply, control unit, IF modulator, converter, output unit.

All the units of the **CW-3000** series Headend have their own power supplies.

The six different voltages (+5V, +8V, +12V, +24V, +40V, -12V) are produced by a switching mode power supply, which is covered by a separate shielding plate in the right of the rack case.

To change mains fuses unplug power cord from the wall outlet and remove top cover. Undo the 2 screws, then move left and lift the shielding cover. The fuse is next to the mains switch (on the power supply panel). Remove the

transparent protective cover and change the fuse (value T0.4 A). Replace the shielding cover, take care to slip the right edge under the bend of the side-wall. Remember to fix the shielding by the 2 screws.

NOTICE: Operation of the power supply without fixed cover is forbidden and dangerous to life!

(This causes disturbances of the output signals as well.)

The secondary fuses can be changed simply after removing the protective cover. Use always the specified types and values!

The simple operation and easy setting of the different parameters is supported by microprocessor control (unit). The control unit can be connected with the **PROGRAMMER (CW-3081)** through a the 6-pole DIN connector of the front panel to check or modify the current parameters.

The operational characteristics and signal levels are displayed by the LED indicators on the front panel. See detailed description in chapter titled *'PROGRAMMING'* .

PROGRAMMING

Install and switch on the unit and connect the **PROGRAMMER** to the 6-pole DIN socket. The **'no co'** (no connection) text appears on the **PROGRAMMER** display first, then the output frequency previously entered, or the number of the nearest standard channel. Different readings or flashing display mean improper operation. For more details see the User's Manual of the **PROGRAMMER**.

Basic rules for programming:

- The parameters to be set can be selected in a menu driven cycle. (The setting of the parameters is described in the order of the round cycle.)
- The numeric values can be set by fast/slow, up/down steps, or can be keyed in directly by the numeric keys. Press **'ENTER'** to terminate the command.
- Press **'STORE'** to complete programming.

SETTING THE PARAMETERS OF THE TV MODULATOR

1. OUTPUT FREQUENCY (OUt)

After switching on, the output frequency (channel frequency) or the channel number will be displayed first. The display mode can be selected by the **CH/FR** key. The output frequency can be tuned continuously, but by pressing the **CH/FR** key the nearest standard channel frequency will be valid, and its abbreviation displayed (see **PROGRAMMER** User's Guide).

The **TV MODULATOR** can be ordered in five different frequency band, and in different standards. The preprogrammed frequency-chart always follows the standard of the concrete unit.

2. OUTPUT SIGNAL OUT/IN (SnL)

0: the output signal is off (for measurement or other purposes). This case is indicated by a slow flashing (0.4 Hz) of the valid LEDs.

1: the output signal is on

3. OUTPUT LEVEL (LE)

The output RF level of the **TV MODULATOR** can be changed in small steps from 1...99. The range is 117...123 dBμV, check the output level. When the output signal is switched off (**SnL**=0), the output level cannot be adjusted, its value is zero.

4. AUTOMATIC OUTPUT LEVEL CONTROL MODES (ALC)

0: continuous ALC, for measurements or HBO-type codes

1: gated ALC, for standard TV signals

5. VIDEO CLAMPER MODES (CLA)

0:diode clamper mode; the front panel **DC REST** LED is flashing quickly (0.8 Hz)

1: controlled clamper mode; the **DC REST** LED will light (continuously), when there is no synchron signal (e.g. there is no video signal at the input). 5 seconds after the synchron signal stops, the circuit will change over automatically; the IF signal level and so the output level will be stabilized according to the syncron peak.

6. CLAMPER TIME CONSTANT (tI)

In the controlled clamper mode, coupling capacitors of different value can be selected.

0:coupling capacitor of lower capacitance is in the circuit, for better hum-rejection of mains. It is useful at studio inputs and long video cables.

1: coupling capacitor of higher capacitance is switched parallel to the capacitor mentioned above. The tilt/pulse drop of the video signal will be less. This mode is useful for short video cable, hum-free signal. At poorer quality signal sources (e.g. some video recorders, noisy satellite reception) disturbing pulses may appear in the synchron signal during the field blanking interval. This disturbs the clamper and can cause unpleasant phenomena (e.g. flashing, flickering picture). The capacitor of higher capacitance cannot be charged by short pulses, so the interference will be less effective.

In diode clamper mode (**CLA**=0), the capacitance cannot be programmed, the **tI**=1 is valid.

7. WHITE CLIPPER (CLI)

The white clipper is used to clip the luminance signal at extremely high white levels in order to prevent modulation depths over 90 %. Otherwise the too light white parts of the picture (e.g. subtitles) can cause a crackling sound in TV sets. The clipper should generally be switched on, and can be off for measuring purposes. The clipping effect is indicated by the flash of the red **'WHCL'** LED on

the front panel. During normal operation, living pictures rarely cause flashes.

The white clipper can be used for approximate adjustment of the modulation depth. Keep watching the TV for a long time and adjust the front panel potentiometer for rare, short flashes of the LED.

0: white clipper off

1: white clipper on

8. SOUND CARRIER FREQUENCY (OUT)

The distance of the sound and vision carriers can be programmed between 4400...6000 kHz. Without concrete setting, the unit will follow its own standard.

D/K standard: 6500.0 kHz

B/G standard: 5500.0 kHz

9. SOUND CARRIER ON/OFF (SCA)

The sound carrier can be switched off for measuring purposes. In stereo applications, the internal sound carrier should be switched off as well, and the two sound carriers should be supplied from external sound encoder-modulator.

0:sound carrier off; the front panel 'SC OFF' LED will keep flashing quickly (0.8 Hz).

1:sound carrier on

10.SOUND CARRIER LEVEL (SL)

The sound carrier level can be canged in small steps 1...99 range. The level range is -20...-10 dB in relation to the level of the vision carrier.

The factory recommendation (the preprogrammed value) is -13 dB. Modification needs measuring equipment.

When the sound carrier is switched off (SCA=0), the level cannot be changed, it is zero volt.

Stepping further on the **PROGRAMMER** you will get to the output frequency function again.

STORING PARAMETER VALUES

Press **STORE** to write the data into the memory. The **PROGRAMMER** acknowledges the **'STORE'** command by a short blanking of the display.

The EEPROM memory can store data for more than 10 years without power. The permitted number of reprogrammings is more than 10000. After **'STORE'** the **PROGRAMMER** can be disconnected.

In case of multichannel systems it is useful to write the names and the frequencies of the radio and TV programs on the front panel labels.

GENERAL INSTRUCTIONS

Unit type numbers and serial numbers are on the bottom labels. During operation these data can be found out by the **PROGRAMMER**. Press **'TYPE'** or **'№'** to display type number or serial number respectively.

At the beginning of programming practice it is useful to recall the values preprogrammed by the factory. This can be a good basis for reprogramming. This function can be selected by pressing keys **'ERROR'** and **'5'** simultaneously.

The **TV MODULATOR** does not need frequent maintenance and readjustment. It is sufficient to check operation and settings once a year.

SPECIAL INSTRUCTIONS

The special characteristics, which should not be changed very often, can be set in a second menu system.

To enter the second menu system press **'ERROR'** and **'CLEAR'** keys at once. This mode is indicated by an underlining signal between the letters and numbers.

To return to the main menu press **'ERROR'** and **'CLEAR'** at once.

The second menu comprises four functions:

1. The internal circuits of the **TV MODULATOR** are controlled by I^2C-bus. To eliminate troubles from power cuts and unexpected electronic disorders, the data in the integrated circuits are refreshed repeatedly. The interval between refreshments can be programmed as follows:
   - Step to select **'rt'** (REFRESH TIME) mode.
   - Number 8 means 2.5 sec REFRESH TIME and every decrement of that number means twice as long interval. Number 1 means more than 5 minutes.
   - We suggest number **'6'**, which corresponds to 10 sec rate.
2. The units of the **CW-3000** system can be remote controlled by Personal Computer. In these applications the units can be identified by their addresses. Addresses from 1 to 99 can be assigned in the second menu system (see above) using **'Ad'** (ADDRESS) mode.

There are two additional functions in the second menu. Though these are accessible for the user, we do not suggest reprogramming them. These values are well preprogrammed by the manufacturer and any change can cause malfunctions. See details in the **PROGRAMMER** User's Guide.

3. The identification number for the TV-standard will be displayed by the abbreviation **'StA'** (STANDARD).
4. The fine tuning of the converter filter can be done by the FILTER FINE TUNING (**FFt**) function.

The **PROGRAMMER** can be used for fast error detection. For checking the wrong unit press the 'ERROR' key. The error-code displayed can be solved by the User's Guide of the **PROGRAMMER**.

NOTICE:

The electronic circuits of the unit are protected against copying so any modifications in the internal control can inhibit normal operation.

Dear User

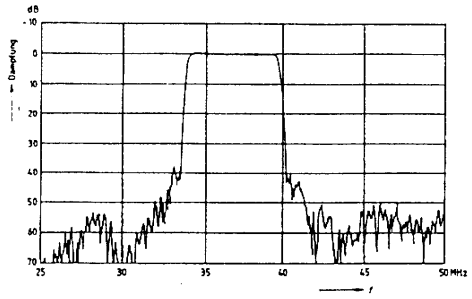
Programming can be learnt only by testing every function in practice. We hope this description can help learning. If any problems come up during operation, our experts are always ready to help you.

N O T I C E !

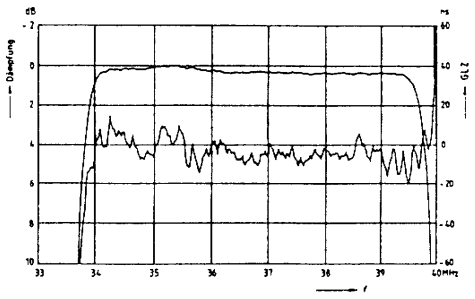
Installation should be done by qualified personnel according to User's Guide of rack cabinet CW-3002. The headend complies with the regulations of standard MSZ-91-85 (IEC-65).

OFW G4903

Durchlaßkurve

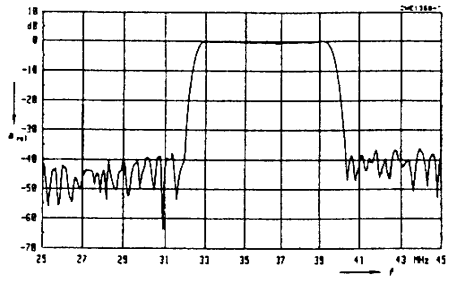


Durchlaßkurve und Gruppenlaufzeit (GLZ)

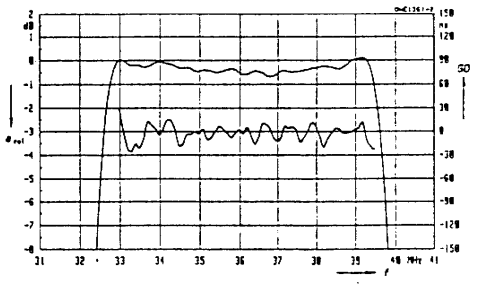


OFW B523

Durchlaßkurve



Durchlaßkurve und Gruppenlaufzeit (*GD*)



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