tube only in the spectrum functions. It allows for the approximate evaluation of the level of the signal in correspondence to the frequency indicated by the marker.

18) SPAN : Engage this bushbutton and the instrument will operate as a spectrum analyser, but the amplitude of the explored frequency band is established by the nearby continuously adjustable control.

19) SPECT : Engage this pushbutton and the instrument will operate as a spectrum analyser covering the entire frequency range of the band selected by means of the pushbutton (4) **''RANGE''**.

20) VF/ ♪ : Engage this pushbutton so that : a) in the **''MEASURE''** function an acoustic note is emitted whose tone is proportional to the level of the signal applied, b) in the spectrum analyser functions the video filter is included.

21) MEASURE : Engage this pushbutton to activate the measurement circuit. The waveform of the TV sync signal is displayed on the left side of the picture tube while, on the top part a luminous band appears to indicate the dBμV level and the rest of the screen is taken up by the TV pattern.

22) AUDIO DEMOD TV- FM - AM : Engage this pushbutton to program the audio demodulators in sequence for : TV with subcarrier modulated in FM, or directly in FM or AM.

23) STD 1- 2 : Pushbutton reserved for special bi-standard operations.

24) FREQ TUNING : Continuously adjustable tuning control.

25) ADD TO dB READING : Switch to select the five attenuation values in 10 dB steps.

CONTROLS ON SIDE PANELS

26) PERITEL : SCART outlet.

27) POWER AC-DC ON / AC-DC OFF (BATT. CH) : Two-position pushbutton: use **AC/DC - ON** to regulate the alternate or direct current power supply operation. On position **AC/DC - OFF (BATT.CH)**, if alternate voltage is present on the mains jack and the general power switch **(28)** in positioned to **ON**, the battery charger is operating. Furthermore, when the instrument is DC battery operated, if released, power supply is interrupted.

28) Mains Jack : For the 230 V alternate current power supply equipped with a built-in protection fuse in operation and a spare one.

29) ON / OFF : General mains switch.

OPERATING INSTRUCTIONS

a) Preparing the instrument for use

For safety reasons, in case of possible damages that the instrument may undergo during transport,instruments purchased with the battery leave our warehouse with the red connection lead to the positive terminal of the battery detached.

It is therefore necessary that the buyer, before using the instrument, reconnects it. This operation may be easily carried out by removing the instrument from the case and reaching the battery by unscrewing the six fixing screws of the rear cover **(see figure 2)**. Connect the lead to the terminal of the battery and once again fix the cover and replace the instrument in its case.

NOTE 1 We advise our customers to recharge the battery of the new instrument even though it leaves our laboratory fully charged since both warehousing and transportation may cover lengthy periods of time.

b) Power Supply

The field strength meter, as already mentioned in the chapter regarding the characteristics, may be power supplied in two modes:

1) Directly from 230V AC mains. ±10% variations in the power supply voltage (207 ÷ 253 V) are withstood without causing any failures in the instrument.
Plug the standard accessory (C84) tripolar power supply cable into the **(28)** current outlet.
Engage the shaft of the mains switch **ON/OFF (29)** to the **ON** position and program the pushbutton **(27) POWER AC-DC ON / AC-DC OFF (BATT.Ch)** to the position **AC-DC ON**, pushbutton engaged.
The **(5)** LED indicator ∿ lights up to indicate the presence of the mains voltage and the fact that the instrument has been turned on.

2) By means of the 12V sealed lead acid storage battery which is an optional accessory supplied on request and is easily incorporated.
To insert the battery see **figure 2** and read the chapter entitled "Storage Battery".
The battery power supply is automatically activated by simply excluding the 230V voltage (the (29) mains switch is positioned to OFF).

WARNING Due to the automatic power supply system (i.e., in the absence of 230V alternate power supply, the battery power supply is automatically activated), to turn off the instrument release the pushbutton **POWER AC-DC ON / AC-DC OFF (27)** to the **AC-DC OFF** position. Remember that to turn off the instrument it is not enough to remove the voltage by disconnecting the mains cord or, in the laboratory, by means of the general switch.

HOW TO INSERT THE BATTERY

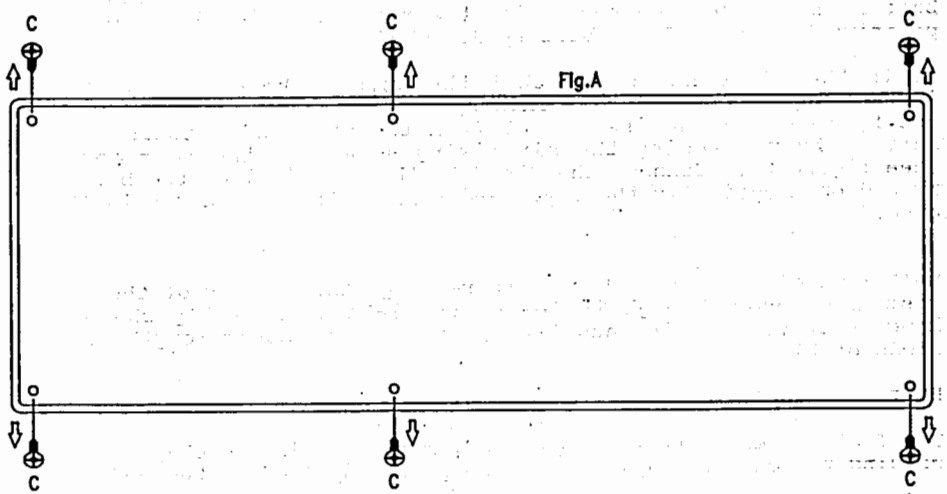


Fig.A

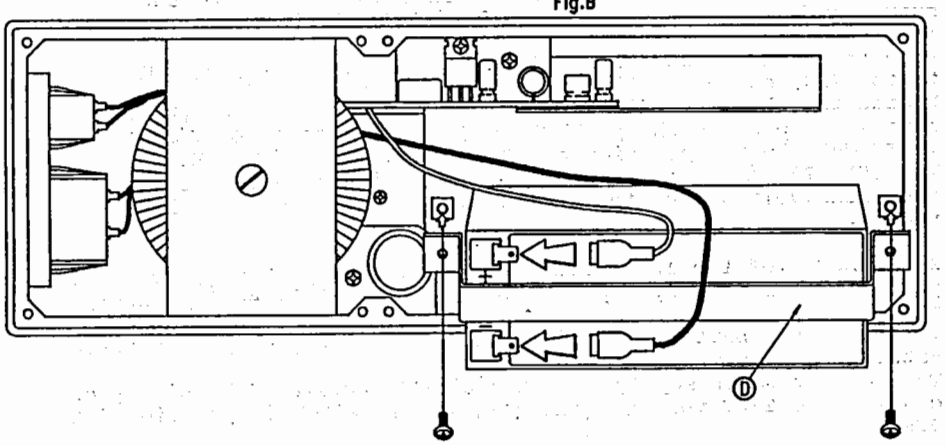


Fig.B

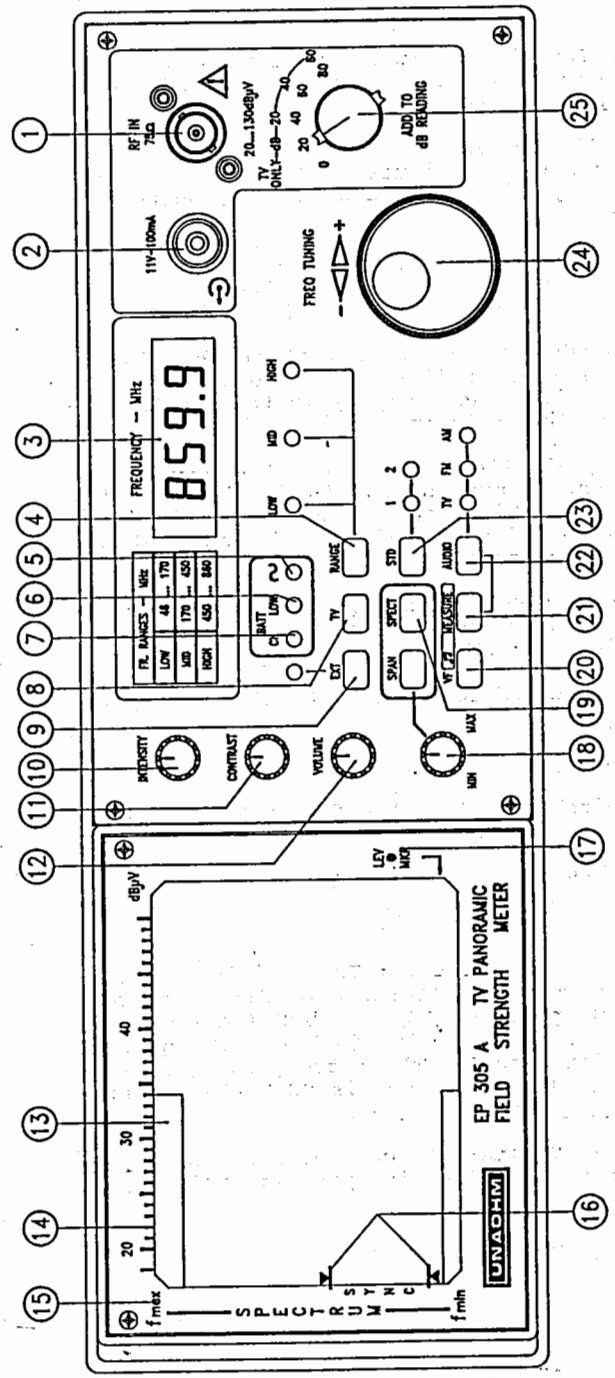
1° UNSCREW THE 6 SCREWS "C" TO REMOVE THE BACK PANEL (Fig.A)

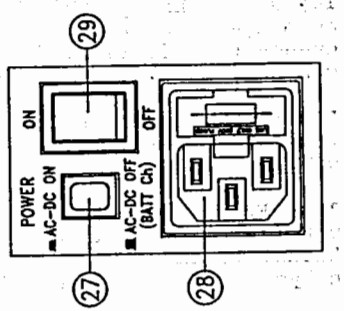
2° REMOVE THE BATTERY HOLDER BRACKET "D" (Fig.B)

3° CONNECT THE RED LEAD TO THE + RED(POSITIVE) TERMINAL AND THE BLACK LEAD TO THE – BLACK(NEGATIVE) TERMINAL

4° FIX THE BATTERY WITH BRACKET AND CLOSE THE INSTRUMENT

Fig.2





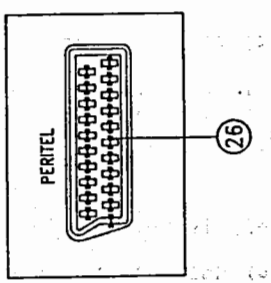


Fig.1

CONTROLS, CONNECTIONS AND INDICATORS ON FRONT PANEL
(SEE FIGURE 1)

1) ⚠ RF IN 75Ω 20...130 dBµV : Coaxial BNC connector for application of test signal. Use the P 80A BNC/IEC adapter for cables equipped with the standard IEC connector.

2) 11V - 100 mA : Output jack for continuous voltage power supply of external accessories and devices.

3) FREQUENCY - MHz: Digital, four digit, indicator of the frequency tuned.

4) RANGE - LOW - MID - HIGH : Engage this pushbutton to switch the reception bands of the instrument which are then introduced in sequence. The LED indicators **''LOW-MID-HIGH''** indicate the operating frequency band.

5) ∿ : LED indicator which lights up to indicate that the instrument is on AC mains voltage power supply.

6) BATT - LOW : LED indicator which lights up to indicate that the incorporated battery has been drained.

7) BATT - Ch : LED indicator which lights up to indicate that battery recharger is operating.

8) TV : Engage this pushbutton for a full-screen display of the tuned TV signal pattern on the tube.

9) EXT : Engage the pushbutton to activate the external video and audio inputs from the SCART outlet. The LED will light up to indicate that this function has been activated.

10) INTENSITY : Continuously adjustable control of the intensity of the pattern observed on the monitor.

11) CONTRAST : Continuously adjustable control of the contrast of the pattern observed on the monitor.

12) VOLUME : Audio volume regulation control.

13) Luminous band; which appears on the picture tube starting from the left and terminating in corrispondence with the value indicated on the reading scale.

14) 20...50 dBµV : Field intensity measurement scale in dBµV.

15) SPECTRUM fmax/fmin : reference scale of the frequency in the spectrum function.

16) SYNC: reference marks of the standard amplitude of the sync pulse.

17) LEV @ MKR : Luminous band; which is displayed on the picture

NOTE this instrument has been designed that, when turned on, the HIGH (band IV/V) frequency range is programmed in the spectrum analysis function and ,for the bistandard models, on the most commonly used standard.

c) Battery Charging

The sealed lead acid 12V - 3Ah battery may be recharged by means of the built-in battery charger.
Program pushbutton **(27) POWER AC-DC ON / AC-DC OFF (BATT.Ch)** to the **AC-DC OFF (BATT.CH)** position (pushbutton released). Obviously the instrument will be 230 V power supplied by means of the **(29)** mains switch on the **ON** position. The **(7) BATT-Ch** LED indicator will light up to indicate that the battery is being charged.

To charge the battery 100% it takes about 7-8 hours.

d) Storage Battery Use

A fully charged battery power supplies the instrument for about 2 hrs. under optimal conditions, guaranteeing the intervention of the stabilising circuits;when the discharge limit is about to be reached, before the instrument goes out of use, the indicator **(6) "BATT.LOW"** lights up.

In this case, it is important to turn off the instrument as soon as possible and recharge the battery.

A negative characteristic of these storage batteries is that, at low temperatures, the capacity is reduced. For example, at -15°C is decreases to 50%.
It is also important that the accumulator is never discharged since, after total discharge, recharge may be a big problem and sometimes even impossible due to irreparable damage caused by the sulphatation of the plates.

When the instrument is not used for a long time, the accumulator should be recharged at least once a month to avoid automatic discharge.

e)Frequency Programming

To tune the instrument to a specific frequency, first of all, select by means of the pushbutton **(4) RANGE** the band that covers the frequency in question.

The frequency ranges, indicated by the illuminated LED's, are :

LOW	**from**	**46**	**to**	**170**	**MHz**
MID	**from**	**170**	**to**	**450**	**MHz**
HIGH	**from**	**450**	**to**	**860**	**MHz**

Furthermore,regulate the tuning control **(24) FREQ. TUNING** ◂− −+▸ until the desired frequency appears on the display **(3) FREQUENCY MHz** display.

f) Measurement

Engage pushbutton **(21) MEASURE** to obtain the five types of information (three regarding the video and two regarding the audio) as follows :

Video
- *** Signal level.**
- *** (partial) TV pattern.**
- *** TV sync waveform.**

Audio
- *** Analogue signal indicator.**
- *** TV sound.**

Level

Connect the downlead cable to the connector **(1) RF IN 75Ω 20...130dBµV.** If the downlead cable ends with the standard IEC connector, insert the BNC/IEC P80A adapter (standard accessory).

Now tune to the channel whose intensity you wish to measure. The reading is visible on the top part of the picture tube by means of a horizontal luminous band **(13)** which starts on the left side of the screen and ends in corrispondence with the level indicated on the **(14) 20...50 dBµV** scale itself.

The signal level may cause the luminous band in question to exceed the right end (full scale) of the screen. In this case, it is absolutely necessary to introduce additional attenuation by means of the attenuation control **(25) ADD TO dB READING.**

The final level of the signal is given by the value indicated on

Mechanical Specifications

Housing : padded nylon carrying case with accessories pocket and shoulder strap for easy transport.

Dimensions :(without nylon bag) (L x H x W) : 300 x 165 x 330 mm.

Weight : 6.5 kg. (including battery).

ACCESSORIES AND MISCELLANEOUS

Standard Accessories

No. 1 C 84 power cord.
No. 1 P80 A BNC/IEC adapter.
No. 1 Conversion rule P 202.
No. 1 3.15A fuse.
No. 1 0.315mA fuse (incorporated in the mains outlet).
No. 1 C 210 nylon bag.
No. 1 Operator's manual.

Optonal Accessories Supplied on Request

12V - 3Ahr. battery.
P121 DC supply injector.
P138 Reflectometer.
P79 and P81 BNC/DIN adapters.

Auxiliary Instruments

FC545 Converter 5÷50MHz.
POL 5 Magnetic "polarotor" power supply.
NG 750 (1.2GHz) and NG752 (2GHz) White Noise Generators.
P257/75 Reflectometer.
P138 Reflectometer with built-in noise generator.
PMP 363 "POLAR MOUNT" power supply.

Special Facilities Supplied on Request

(1) 50Ω Input Impedance.
(2) The frequency range may be extended to 900MHz.
(3) Other TV standards may be supplied.
(4) 117V 60Hz.

- Full screen TV pattern;
- Simultaneous display of : (partial) TV pattern, level measurement by means of horizontal luminous band and horizontal sync waveform;
- Panoramic display of the entire frequency band received and related marker to identify the exact frequency;
- Partial panoramic display (continuously adjustable).

Miscellaneous

Audio : 0.3W max. power, volume regulation control.

Audio Input-Output: 0.2V - 600 Ω into SCART outlet.

DC Voltage Output : 11V - 100mA, automatic protection circuit.

Demodulation : AM peak - AM average value - FM (switchable).

Power Supply

In Alternate Current : 230V ±10% 50 ÷ 60Hz. 40W. (4)

In Direct Current : by means of incorporated rechargeable sealed lead-acid battery 12V - 3 Ahr. (supplied on request).

Duration : approx. 2 hr.

Battery Charger : 14V - 0.5 A (built-in).

Indicators : Battery drain and recharge in process.

Environmental Specifications

Calibration Temperature : the specified accuracies refer to a 23° C ambient temperature.

Operation Temperature : from 0° to +45° C.

Relative Humidity : 85%.

Warehousing Temperature : from -10° to + 60° C.

Relative Humidity : less than 95%.

Maximum Altitude : 4000mts.

the scale **(14) 20...50 dBμV**, plus the attenuation introduced by means of the switch **(25) ADD TO dB READING.**

NOTE

When the meter is used in connection with Unaohm noise generator NG750 or NG 752 a warning is in order to avoid measuring errors, as follows:

a) The amount of energy developed in a circuit is related to its frequency bandwidth due to the particular spectral distribution of the noise signal.

b) The RF input stage of the meter has a bandwidth of 8MHz. The IF measuring stage has a narrow bandwidth of 1 MHz.

c) It is, therefore, necessary that the measuring bar on the picture tube be limited to 40dB full scale deviation rather than 50dB in order to avoid overloading of the input stage with the noise signal.

The maximum measuring range is thus reduced from 130dBμV to 120. This limitation applies to spectrum mode as well.

TV Pattern (partial)

The possibility of observing the TV pattern simultaneously with the level measurement is of absolute importance since the operator has the quality of the image until continuous control this way.

NOTE

With input signals having a level above 70dBμV (in the ranges **"ADD TO dB READING 40-60-80"** as specified in the table below) RF attenuation cells may be introduced into the input which may degrade the signal-to-noise ratio on the TV pattern (snow effect).

Under such conditions if you wish to obtain the best possible TV picture switch to full TV picture mode and disengage some attenuation by means of control 25.
In details :

20...90dBμV attenuator **"ADD TO dB READING"** on 0
90..110dBμV attenuator **"ADD TO dB READING"** su 20
110..130dBμV attenuator **"ADD TO dB READING"** su 40

Disposition of attenuazion cells in the function "MEASURE"				
ADD TO dB READING (control 25)	ATTENUATION dB		FULL SCALE RANGE dBµV	NOTES
	RF	IF		
0	0	0	50	AGC excluded
20	0	20	70	
40	20	20	90	
60	40	20	110	
80	60	20	130	

Sync Pulse Display

Additional information may be obtained by visualizing the video sync pulse as well, just as on a common oscilloscope.
The following important information may be obtained by observing the waveform :

the presence of burst indicates that the TV station transmits color coded signals.

the presence of sync signal compression due to overloaded amplifiers. The standard sync pulse is 30% of the total amplitude of the video signal; to facilitate the evaluation, on the screen, two reference indexes, **(16)** ▼/▲, are traced.

possible interferences overlapping the sync signal are visible.

the signal waveform itself, in particular the leading edge and trailing edge already allow for an evaluation of the video response of the installation.

NOTE The amplitude of the sync pulse is directly proportional to the modulation depth of the TV station which is normally 90-95%. The stations that modulate with a lower depth will also have a sync pulse with proportional amplitude.

Analogic Audio Signal Indicator

A very useful facility offered by this model is the acoustic indication of the signal level. All of the controls programmed for a quantitative measurement of the level of the available signal remain unchanged and then engage the pushbutton **(20) VF/♪**, rotate

MAIN SPECIFICATIONS

Input Specifications

Sensitivity : from 20 dBµV to 130 dBµV. (0dBµV = 1µV).

Attenuator : five 20 dB ranges.

Attenuator Accuracy : within ± 1dB throughout the entire frequency range.

Indication : directly on the picture tube by means of a horizontal luminous band with 20 - 50 dB reading scale. Accuracy within ±5% of the scale length.
Sensitive to the (switchable) peak or average value with dBµV reading scale and rms calibration.
An acoustic note, heard on the loudspeakers,may be introduced and its tonality is proportional to the intensity of the signal received.

Measurement Accuracy : within ±1.5 dB.

Impedance : 75Ω (1) unbalanced, with continuous component block up to 100V.

Input Connector : "BNC" or IEC, by means of P80A adapter (a standard accessory).

Maximum Voltage Applicable : RF 5 Vrms. DC 100 V.

Frequency Specifications

Frequency Range : from 45 to 860 MHz (2), in three continuously adjustable ranges.

Reading : four digit, LCD digital display with 100kHz resolution.

Accuracy : that of the reference quartz ±1 digit.

Monitor Specifications

Screen : 4.5" (black and white) with related brightness and contrast controls.

Video Input - Output : 1 Vpp, Z = 75Ω, into SCART outlet.

Reception Standard : B/G (3).

Video Filter : may be disactivated.

Functions : the following may be displayed on the screen :

INTRODUCTION

Our EP 305 is a field strength meter for terrestrial TV,FM and AM signals offering the continuous coverage of the frequency range from 46 to 860 MHz.

The following are the functions and facilities that this instrument performs :

- **TV, FM and AM frequency range from 46 to 860 MHz in three bands with four digit digital frequency meter.**
- **Level measurement from 20 to 130 dBμV in five ranges.**
- **Automatic frequency response linearization system.**
- **Within 1.5 dB accuracy.**
- **Acoustic level indication.**
- **Spectrum analyser and marker with digital frequency reading.**
- **TV picture on a 4.5" black and white tube.**
- **Simultaneous display of : TV pattern, sync waveform and signal level.**
- **TV-FM-AM audio demodulator.**
- **11V/100mA auxiliary output.**
- **SCART outlet.**
- **Video filter.**

The instrument is housed in a padded nylon carrying bag which is equipped with an accessory pocket and shoulder strap.

control **(12) VOLUME** until the desired intensity of the sound has been obtained.
The built-in loudspeaker will emit a continuous acoustic note whose frequency is directly proportional to the level of the applied signal.
This function allows the operator who at times operates under extremely difficult conditions that prevent his constant viewing of the monitor (for example, during dish aiming, calibration of the channel equalizers,etc.) to proceed simply on the basis of the note emitted which becomes increasing acute as the amplitude of the signal increases.
Furthermore, when the luminous band that indicates the amplitude of the signal exceeds full scale and therefore makes it necessary to pass to a higher range, the note emitted becomes intermittent.

NOTE this function is stored until the operator decides to cancel it by engaging again the pushbutton **V/F**). As a result, passing to other measurement functions (spectrum analyser,etc.) and then returning to the **MEASURE** function, the analogic sound remains operative.

TV Audio

One of the most versatile characteristics of this instrument is the possibility to select in sequence among three audio demodulators by means of the pushbutton **(22) AUDIO DEMOD.** The luminous indicators **TV - FM - AM** indicate the one in operation. The use of these demodulators depends on the modulation characteristics of the signal received which may be :

* **TV** with B/G standard (the one adopted in Italy and in almost all of Europe) with 5.5 MHz audio intercarrier.

* **FM** FM modulated carrier (for example, an FM radio station).

* **AM** with French L TV standard and AM audio modulation or an AM modulated carrier (for example, a remote control).

g) TV Pattern

Engage the pushbutton **(8) TV** to program the instrument for TV. The C.R.T. will display the image of the TV signal received on full screen; carefully regulate controls **(11) CONTRAST, (10) INTENSITY** and **(12) VOLUME** until the desired video and audio quality has been obtained.

In particular, when a fixed pattern such as the test pattern is received, we recommend careful observation of the vertical bars or, better yet, the 2T pulse placed at the center of the pattern to check on possible reflections.

h) Spectrum Analyser

The field strength meter is equipped with the spectrum analyser

function.
The spectrum analyser presents the various frequency components of the input signal in the form of horizontal lines (spectrum). The appearance of one single line indicates that the input signal is a pure sinusoidal wave of a particular frequency. The appearance of more than one line indicates the presence of other frequencies in the input signal.
In particular, a television signal is mainly composed of two carriers : video and audio, which are 5.5MHz apart from each other (for the B/G standard). Each carrier is modulated: the video carrier in amplitude with a bandwidth that extends to 5MHz, the audio carrier is frequency modulated with a band of approx. 300kHz.
The chrominance signal ;i.e.,color information, which is also present in the video signal, is quadrature modulated (phase and amplitude modulation) with 4.43MHz (suppressed) subcarrier frequency. As a result, the TV signal spectrum observed on the tube is a complex pattern in which the two main carriers (video and audio) stand out. Furthermore, while the audio shows no noteworthy amplitude variations due to frequency modulation, the video varies continuously in amplitude due to the AM modulation.
The side bands of the chrominance signal are also visible, even if weak, but also their amplitude and width are continuously variable with respect to the saturation and shade of the TV pattern.
To program the instrument as a spectrum analyser, engage pushbutton **(19) SPECT.** In these conditions the entire frequency band selected is explored; remember that to select the various frequency bands it is necessary to engage pushbutton **(4) RANGE.**
A marker is also available to single out one of the spectrum frequencies, with reading on the digital frequency meter **(3) FREQUENCY - MHz.** The control **(24) FREQ TUNING** -◂ ▸+ makes it possible to shift the marker along the entire vertical axis of the frequencies.
On the bottom end of the screen there is also a luminous bar **(17)** which makes it possible to evaluate the level of the signal (approx. with reference to the scale **(14) dBμV)** in correspondence to the frequency indicated by the marker.

If you are interested in observing with greater accuracy the spectral composition of a certain signal, first center the marker on the frequency you wish to observe and then engage pushbutton **(18) SPAN.** This way a portion of the frequency band in question,near the central value of the marker, is explored. The continuously adjustable control **(18) MIN - MAX** makes it possible to vary the width of the explored band portion.

i) SCART Outlet (auxiliary audio and video inputs and outputs)

On the right side of the instrument is the **(26) SCART** outlet for the video and audio exchange with external inputs/outputs. It is therefore possible to control an external monitor or receive signals to control the field strength meter monitor. The commutation may be obtained by engaging the pushbutton **(9) EXT.**
The video output (contact No. 19) may be used, for example, to control, by means of an external oscilloscope, the video signal

Do Not Substitute Parts or Modify Instruments

Because of the danger of introducing additional hazard do not install or substitute parts or perform any unauthorized modification to the instrument.

X-RAY RADIATION

When operating the unit emits X-rays, however, it is well shielded and meets safety and health requirements of CEI 348.

Radiation emitted by this instrument is less than 0.5mR/hr. at a distance of five (5) centimeters from the surface of the cathode ray tube. The X-ray radiation primarily depends on the characteristics of the cathode ray tube and its associated low voltage and high voltage circuitry. To ensure safe operation of the instrument, adjust both the low and high voltage power supplies as mentioned in the adjustment section of this manual.

Replace the cathode ray tube with an identical CRT only.

GENERAL WARNINGS

The following general safety precautions must be observed during all phases of operation, service and repair of this unit. Operators must comply with these precautions and follow the normal operation procedure as mentioned in this manual. START S.p.A. assumes no responsibility for any failure by the customer to comply with the above.
This instrument complies with CEI safety standard, class I.

Grounding the instrument

To minimize shock hazard the chassis and cabinet of the unit must be connected to an electrical ground. The unit is equipped with a three-conductor power cord. The cord must either be plugged into an approved three-contact electrical outlet or used with a three-to-two-contact adapter with the ground wire (green) firmly connected to an electrical ground (safety ground) at the power outlet. The power cord and AC outlet meet CEI safety standards.

Do not Operate in an Explosive Atmosphere

Do not operate this unit in the presence of inflammable gas or fumes. The operation of any electric instrument in such an environment constitutes a definite safety hazard.

Keep away from Live Circuits

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel only. Do not replace components with power cord connected. Under certain conditions dangerous voltages may exist even with the power cord removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

Do Not Service or Adjust Alone

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

waveform.

SCART socket connections:

1 - 3	=	Audio output (in parallel, always present).
2 - 6	=	Audio input (in parallel, always present).
7-11-15-16	=	N.C.
8	=	N.C.
19	=	Video output (always present).
20	=	Video input.
4-9-13-18-21	=	Ground.

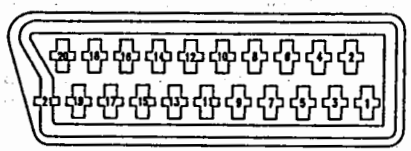


Fig. 3

j) FM or AM Modulated RF Signal Reception

In addition to the measurement of TV signals, this instrument may be used to measure RF carriers with FM or AM modulation.
It is therefore necessary to select the related audio demodulator by engaging pushbutton **(22) AUDIO - DEMOD** until the pilot light **FM** or **AM** turns on.
The measurement procedure is the same as that of TV.
The demodulated LF signal output is available on SCART outlet contact 1-3.

NOTE Remember that the bandwidth of the field strength meter is 7 MHz for the input circuit preselector and 1MHz for IF phases.
For example, the measurement of signals in the FM band (with 300kHz distance between the various carriers) is not reliable.
A reliable measurement may be obtained with carriers at a distance of 1 MHz from each other.

k) TV Standard

This instrument may select two different types of TV standards. The present version is equipped with only the European B/G standard.
On request other types of standards or bistandards may be supplied (for example B/G - L for France, B/G - D/K East Europe, B/G - I for England, etc).

Table N°1 below indicates the main characteristics (specifically concerning the field strength meter)of the most commonly used standards.

Pushbutton **"STD" (23)** allows for the selection of the preestablished standards,when engaged in sequence the luminous indicators **1** or **2** indicate the one included.

NOTE When the instrument is turned on, in the case of bistandard units,it is programmed on the most commonly used standard.

TABLE N°1 TV STANDARD

TV STAN.	NUMBER OF LINES	CHAN. WIDTH MHz	VISION BANDW. MHz	VIS/SOU. SEPARAT. MHz	VESTIGIAL SIDE BAND MHz	MODULAT.		VIS/SOU. RATIO dB
						VIS.	SOU.	
B	625	7	5	+5.5	0.75	Neg.	FM	10 to 13
D	625	8	6	+6.5	0.75	Neg.	FM	7 to 10
G	625	8	5	+5.5	0.75	Neg.	FM	13 to 20
H	625	8	5	+5.5	1.25	Neg.	FM	7 to 10
I	625	8	5.5	+6.0	1.25	Neg.	FM	7
K	625	8	6	+6.5	0.75	Neg.	FM	7 to 10
K1	625	8	6	+6.5	1.25	Neg.	FM	10
L	625	8	6	+6.5	1.25	Pos.	AM	10
M	525	6	4.2	+4.5	0.75	Neg.	FM	7 to 10
N	625	6	4.2	+4.5	0.75	Neg.	FM	7 to 10

GENERAL WARNINGS

Before applying the power supply voltage make sure that it corresponds to the one indicated on the plate near the mains socket. The instrument will continue to operate properly even in case of ±10% voltage variations (this limit is not to be exceeded).
Do not leave the instrument with a still picture on maximum luminosity for a long period of time. This could permanently damage the C.R.T.
Do not apply DC or RF voltages to the input connectors that are higher than those indicated. They could seriously damage the input circuits.
Do not place the instrument near sources of strong magnetic fields such as motors, transformers and, in general, electrical power instruments. They could deform or interfere with the reproduced TV pattern.
One of the most frequent needs for technical assistance or repair is caused by internal shortcircuits due to the introduction of foreign objects, even if very small, in spite of all the precautions taken to prevent this possibility. We therefore highly recommend not to cut coaxial cables near the instrument since even very small pieces of wire from the shielding braid could fall into the instrument and cause occasional shortcircuiting difficult to locate.
Do not obstruct the instrument's cooling slits fenditure or place it near strong sources of heat.
For prolonged use in the lab or in fixed places, the instrument should be removed from the carrying case to allow for better heat dissipation.

⚠ **We recommend periodic inspection of the carrying strap, the related fasteners, and the clips which could be damaged with use.As soon as signs of wear are noticed substitute them. Furthermore, make sure that the fastening screws of the instruments with handles are properly tightened.**

This instrument is provided with a back-up battery, to power supply the module that indicates the date and time.
If the unit is not used for a long period of time, the battery discharges and therefore the information stored is lost.
It is therefore necessary if you wish to retain the stored information to power supply the instrument periodically (every 30 days).
In any case, if the time and/or date are incorrect it is always possible to reset them (see utility routine chapter).
Some circuits may be irreparably damaged by electrostatic charges. We therefore recommend not to touch the internal circuits of the instrument unless you wear the special antistatic straps.

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WARRANTY

This Unaohm instrument is guaranteed against defects in workmanship and materials for a period of one year. Any necessary adjustments or repairs will be provided from our works or our representatives' service centre where the instrument is to be delivered packed in adequate packing AFTER an authorization for return has been received.

The owner's responsibilities are to use the instrument in accordance with its written instructions, to provide transport to and from the factory or its service centre in the event service is required, and to provide proof of purchase if requested.

Exclusion:

The warranty does not cover malfunction due to electrical, mechanical or other types of abuse. It does not cover malfunction due to disassembly and attempted repair by anyone but ourselves. It does not cover shipping damages (which are covered by the carrier. The instrument should be returned well packed and insured). The warranty does not cover instruments whose serial number has been removed or obliterated. The battery is not covered by the warranty.

The warranty applies to this instrument alone and,consequently, does not cover damage to other equipment, property or persons arising from a malfunction of the instrument.

In case of controversy, the competent jurisdiction is Milan,Italy.

MISCELLANEA

The specifications listed are subject to change without notice. Specifications given with tolerances are the performance standards against which the instrument may be tested.
Specifications given without tolerance are merely indicative and represent production average.

S/N 62568

Field strength meter

EP 305 A