



OM 30 - 50 - 100 W FM Transmitter



GENERAL DESCRIPTION

KEY FEATURES

The equipment has been designed by using the latest available technologies and techniques in Hardware and Software.

The following key features are notable:

- * State of the art performance at reasonable cost.
- * P controlled.
- * Extremely low distortion: THD, IMD & TIM (Transient Intermodulation Distortion) specified.
- * Very quiet operation (S/N).
- * Highest stereo performance: separation 80 Hz-15 kHz typ. 70 dB (30-80Hz typ. 60dB).
- * L, R (balanced & unbalanced), RDS / SCA, AUX, MPX, Digital inputs AES-EBU XLR & Optical (Optional), External Reference Oscillator input & output (Optional)..
- * Lin, 50, 75s pre-emphasis.
- * Seven complete programs (frequency, sensitivity, power, etc.) can be stored and selected in local or remote mode, without retuning or re-adjustments. Ready for (6+ 1) systems.
- * Completely broadband: instantaneous BW > 20 MHz.
- * Easy to handle: self-explaining monitoring of all important parameters and setting values.
- * Remote control (telemetry and command) available on the rear panel (DB25, DB9)
- * Two independent RS485 ports (on rear panel).
- * Modular construction, specifically designed to minimize the spare parts set.
- * Auxiliary functions as multi-frequency external synchronization (1;2; 2,5;5; 10 MHz) on request.



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- * All RF amplifiers using the latest generation semiconductors: RF Power LDMOS both in driver and output stages.
- * Automatic Power Control (APC), maintaining stable pre-set RF power @ 45C ; 1.5:1 VSWR. Higher VSWR value causes a power reduction.
- * Lightweight RF power modules that can be removed from the mainframe and replaced in less than two minutes.
- * Very fast acquisition latching indicators showing the transient conditions.
- * Nominal RF o/p level = 30W (50, 100W). Typical max power in excess of 35W (60, 110W). Power output continuously adjustable.
- * High spectral purity: > -100 dBc spurious and > -75 dBc harmonics (typ.).
- * Provides the following outputs: RF, RF monitor, 19 kHz to lock RDS, RS485, USB, remote alarm, and remote memory setting. Telemeasurement. External Battery socket (Optional) with built-in charger, (2x12V) for emergency.
- * AC mains (90-260V in two ranges) reliable PWS.
- * CCIR & FCC compliant.
- * All functions controlled by a single knob and a two-rows/sixteen characters LCD display. Intuitive parameters configuration.
- * External control of alarms, of active memory, interlock, force to internal stereo, TX-on, TX -off, ack-on, ack-off, mains absence, power good, IPA, VPA, MODULATION, REFLECTED PWR, FORWARD PWR through a DB25 connector located on the rear panel.
- * Seven memories (M1 to M7): all data (i.e. frequency, audio sensitivity, RF power, etc.) can be stored on a flash memory of the microprocessor and recalled by internal/external command.
- * Windows SW for a complete management of all transmitter functions.

METER READINGS

The following parameters can be read on the front display :

- Forward power.
- Reflected power.
- DC Supply voltages.
- Frequency (active channel).
- Frequency (stored channels n 1 to n 6).
- Mono and stereo sensitivity (0.25 dB step).
- Output power programmed.
- MPX peak modulation.
- L & R peak level.
- RDS, SCA, Aux, MPX ext modulation.
- Audio programmed parameters (+L or -L, +R or -R, L on/off, R on/off, Preemphasis lin, 50, 75 S, Limiter on/off, Input Impedance Z= 10KOhm/ 600 Ohm,
- Alarm status
- Memory status
- Internal voltages
- Serial Number

RF CHARACTERISTICS

| | | |
|-----|------------------------|---|
| 1. | Power | 100 W adjustable from front panel |
| 2. | RF output impedance | 50 Ohm unbalanced, VSWR less than 1.5:1 |
| 3. | Frequency range | 87.5 to 108 MHz, 7 channels (10 kHz / step μ p selected) can be stored and recalled from panel, rear contacts, or via USB connection. |
| 4. | Frequency control | Synthesizer μ processor controlled |
| 5. | Lock in Time | From starting to any programmed frequency: typically 4 sec. |
| 6. | Off lock attenuation | > 75 dBc (typical -80 dB) |
| 7. | Type of modulation | F3E / F8E direct FM at the carrier frequency |
| 8. | Modulation mode | Mono, Stereo, Multiplex, SCA, RDS, AUX (input selected by front panel) |
| 9. | Frequency deviation | ± 75 kHz = 100 %, ± 150 kHz capability |
| 10. | Reference | TCXO = 12.8 MHz. |
| 11. | Constancy of fq. dev. | ± 1 % over six months. |
| 12. | Variation of fr. | < 1 kHz/year (internal TCXO) |
| 13. | Short term stability | ± 1 ppm from -5 to +45 C, Can be synchronized by 1-2-2.5-5-10MHz self select external clock (OPT 01) |
| 14. | Instantaneous BW | >20 MHz |
| 15. | RF harmonics | Exceeds EBU/CCIR/FCC requirements > -70dBc |
| 16. | RF spurious | Exceeds EBU/CCIR/FCC requirements < -100 dBc @ ± 1 MHz min. out of carrier (typical -110dB) |
| 17. | Preemphasis | Flat/50/75 μ s selectable via front panel |
| 18. | Pre-emphasis precision | Nominal 1% (typical 0,4%) |
| 19. | Stereo operation | CCIR 450/S2 "pilot tone system" |

STEREO OPERATION

| | | |
|-----|-------------------------------|--|
| 20. | Audio response | ± 0.15 dB da 20 Hz to 15 kHz (+0/-2%) |
| 21. | Audio filter attenuation | > 55 dB @ 19 kHz, >45dB 19 to 100kHz |
| 22. | Common mode rejection | 20 Hz to 15 kHz ± 45 dB |
| 23. | Stereo Separation | 30-80Hz >53dB (typ. 56), 80Hz-15kHz >60 dB (typ.70) |
| 24. | Crosstalk attenuation (M / S) | >40 dB 30 Hz to 15 kHz (typ. 55dB / 100Hz to 8 kHz) |
| 25. | Spurious products | >53 kHz ± 50 dB |
| 26. | 38 kHz suppression | >70 dB (Typ -85dB) |
| 27. | Subcarrier frequency | 38 kHz ± 2 Hz |
| 28. | Subcarrier generation | Internal crystal |
| 29. | Pilot frequency | 19 kHz ± 1 Hz |
| 30. | Phase difference | 19/38 kHz 02 adjustable |
| 31. | THD+N on encoded channels | <0.03 % 30 Hz TO 15 kHz (typ -74dB) |
| 32. | IMD | Measured with a 1 KHz and 1.3 KHz tones, 1:1ratio, at FM 75 kHz ± 0.03 %Typ. IMD D2 < -83 dB D3 < -88 dB |
| 33. | TIM (DIM30) | ± 0.03 % (square/sinus) Typ. < -77 dB34. Nominal pilot deviation ± 7 kHz |

MONO OPERATION

| | | |
|-----|---------------------------|--|
| 35. | Audio response | ± 0.15 dB 20 Hz to 15 kHz (+0/-2%) |
| 36. | THD+N on encoded channels | 30 Hz to 15 kHz < 0.02% (typ. 0.03 %) typ. -74dB |
| 37. | IMD | Measured with a 1 KHz and 1.3 KHz tones, 1:1ratio, at FM 75 kHz D2 < -75 dB D3 < -80 dB Typ. D2<-80dB D3< -85 dB |
| 38. | TIM (DIM30) | Measured with a 2.96 kHz square wave and a 14 kHz sine wave at 75 kHz FM < -70 dB Typ. < -77 dB |

MPX OPERATION (External coder)

| | | |
|-----|---------------------------|--|
| 39. | Audio response | 30Hz - 53kHz: ± 0.1 dB 53kHz - 100kHz: ± 0.2 dB |
| 40. | THD+N on encoded channels | 30 Hz to 15 kHz ± 0.03 % (typ. 0.02%, < -75dB) |
| 41. | IMD | Measured with a 1 KHz and 1.3 KHz tones, 1:1ratio, at FM 75 kHz D2<-75 dB D3<-80 dB Typ. D2<-80dB D3< -85 dB |
| 42. | TIM (DIM30) | Measured with a 2.96 kHz square wave and a 14 kHz sine wave at 75 kHz FM < -70 dB Typ. < -75 dB |

S/N RATIO (Typ. Values)

| | | |
|--|---------------------------------|--|
| Mono (RMS Detector) | | |
| Ref. ± 75 kHz | Weighted (CCIR 468/2) | 89 dB/50 μ s 83 dB/flat |
| Ref. ± 75 kHz | Unweighted (20 Hz-23 kHz) | 92 dB/50 μ s 88 dB/flat |
| Built-in stereo encoder L & R or external stereo | | |
| | Weighted (CCIR 468/2) | 79 dB/50 μ s 72 dB/flat |
| | Unweighted (20 Hz-23 kHz) | 86 dB/50 μ s 80 dB/flat |
| Am synchronous | Unweighted (20 Hz \div 23kHz) | 69 dB |
| | | AM= 400 Hz Fm= 400 Hz ± 75 kHz Ref. = 100 % AM |
| Am asynchronous | Weighted & unweighted | 70 dB |
| | | Fm = no modulation Ref. = 100 % AM |

AUDIO INPUTS

| | | | | | |
|-----------|--------------|---------|---------------|------------------|--|
| Composite | -3 to +6 dBm | 0.15 dB | 30Hz - 100kHz | ~1.2 kOhm Unbal. | BNC Connector |
| SCA/RDS | -3 to +6 dBm | 0.15 dB | 40kHz- 100kHz | ~3 kOhm Unbal. | BNC Connector |
| Aux | -3 to +6 dBm | 0.15 dB | 40kHz-100kHz | ~3 kOhm Unbal. | BNC Connector |
| L | | | | | (3 dB step adjustable by software -3 to +9 dBm / ± 0.5 dBm) |
| R | | | | | 0.1 dB 30Hz± 15kHz 10 kOhm Unbal. 600 Ohm Bal. XLR cONNECTOR |
| | | | | | (3 dB step adjustable by software -3 to +9 dBm / ± 0.5 dBm) |
| | | | | | 0.1 dB 30Hz± 15kHz 10 kOhm Unbal. 600 Ohm Bal. XLR cONNECTOR |

OUTPUTS

| | |
|-------------------|--|
| RF connector | N female |
| Monitor RF output | -44dBc± 2dB from 87.5 to 108 MHz |
| Pilot | BNC connector 19 kHz Square wave, level 1 Vpp, impedance > 5kOhm unbalanced type |

AUXILIARY CONNECTIONS

| | |
|---------------------------------|-----------------------|
| USB | USB type B-female |
| RS485 Serial Interface #1 | RJ45 |
| RS485 Serial Interface #2 | RJ45 |
| Telemetry/Telecontrol Interface | DB25F |
| External clock 1-2-2.5-5-10 MHz | SMA female (Optional) |
| Telemetry/Telecontrol Interface | DB25F |
| Telemetry/Telecontrol Interface | DB25F |

OPTIONS

| | | |
|------------------------------------|---------|---|
| External Clock with self selection | JZOP-01 | For PLL synchronizing purpose. 1-2-2.5-5-10 MHz EXT Ref. Oscillator of the incoming frequency |
| 24V backup input | JZOP-02 | Two 12V batteries sealed lead can be supplied |
| Telemetry interface | JZOP-03 | From DB 25 to terminal block, opto isolated I/O |
| Digital audio Input | JZOP-04 | AES-EBU facilities XLR balanced (S/PDIF) & TOS-LINK supplied |
| RDS | JZOP-05 | RDS simple coder programmable via PC |
| OIRT Version | JZOP-06 | Different band of frequency |
| FSK identification Version (FCC) | JZOP-07 | LPFM frequency shift-key Morse code for station identification |
| Only MONO Version | JZOP-08 | |

VARIOUS

| | |
|----------------|---------------------------|
| Cooling | Forced, with internal fan |
| Acoustic Noise | < 56 dBA Leq 3 min @ 1 m |

STANDARD COMPLIANCE

| | |
|-----------------------|----------------------|
| Safety | EN60215:1989 |
| EMC | EN 301 489-11 V1.2.1 |
| Spectrum Optimization | ETS 300 447 |

ENVIRONMENTAL

| | |
|------------------------------------|-------------------|
| Storage temperature | -20 °C TO + 60 °C |
| Operating temperature | -5 °C TO + 45 °C |
| Guaranteed performance temp. | 0 °C TO + 40 °C |
| Relative humidity (non condensing) | 90 % MA |
| Max operating altitude | 2000 mt |
| Max extraneous field strength | 10 V/m; 4 A/m |

PHYSICAL & ELECTRICAL

| | |
|-------------------------------|---|
| Dimensions | Standard 19" chassis /1 U rack |
| Cabinet | 385 mm deep by 485 mm wide, 44 mm height |
| Weight | 4.5 kg. |
| Finish | Plastic film on aluminum (front panels). Stainless steel (cabinet). |
| Power supply | 110/220V single phase AC (+10 / -15 %) 50-60Hz/ ± 5% DC |
| Battery supply voltage | 2 x 12 - 14V Gelled Lead Acid Batteries |
| DC supply current | Measured at full power and 28VDC, 2A |
| AC Apparent Power Consumption | Measured at full power and nominal voltage. 135 VA |
| Power Consumption | Measured at full power and nominal voltage 95 W |
| Human interface input device | Rotary encoder with pushbutton |
| Display | Green-Yellow back panel, LCD - 2 raw 16 characters |
| Acoustic Noise | < 56 dBA Leq 3 min @ 1 m |
| Cooling | Forced air, with internal long life brush-less ball bearing fan |