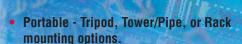
Microwave Radios

Portable, Tunable, High-Capacity Microwave Transceiver

TCM-930



- Ruggedized Capable of operation in extreme outdoor environments.
- Integrated Internal Programmable High-Speed Modem - Programmable for QPSK or 16 QAM to 128 QAM.
- Modular Customer Interfaces Easily field change interfaces between 155 Mbps OC3/STM-1, single/multiple DS3/E3/STS-1 or 100 Base T.
- Field-Tunable Continuously tunable across entire operational frequency band.
- Multiple RF Bands Transceiver can be easily reconfigured by customer to any RF band by changing the plug-in transmitter and receiver modules and antenna feed.
- User-Friendly Radio operation controlled via radio front panel keypad and alphanumeric display. All connectors are on radio front panel.



Excellence You Can Measure



The TCM-930 is designed to serve as a high-capacity, temporary service or emergency restoration radio. It will operate in an outdoor environment with no protection from the elements, and can be set up for operation in a matter of minutes!

Digital interfaces on the front panel of the radio terminal can be changed in the field as needed by the operator from direct interface 155 Mbps OC3/STM-1, to single/multiple DS3, E3 or STM-1 channels, or a 100 BaseT channel. The TCM-930 can be transported without worry of damage due to its heritage TerraCom rugged mechanical design. Any unique user interface with data rates between 19 Mbps and 210 Mbps can be accommodated.

The radio modem offers programmable modulation waveforms (QPSK and 16 QAM to 128 QAM) with adaptive equalization and variable FEC rates. Customers desiring to utilize external third-party modem technology may interface to the radio via input and output 70 MHz IF ports (consult factory for interface compatibility requirements).

RF Branching - TX/RX Frequency Separation

Configurations of up to 3+0 can be accommodated on a single antenna. Built-in tunable transmit and receive pre-select filters and circulators are used to allow multiple transmitters and receivers to be combined onto the antenna system. The RF filter and LO tuning is fully automatic and controlled by the built-in microprocessor from the radio front panel keypad.

The radio also provides 2 full duplex asynchronous RS-232 user service channels and a voice orderwire channel.

The Next Generation TCM-930-microwave radio system follows L-3 TW's continued worldwide success with their TCM-600 and TCM-620 Series radios. These radios are deployed in over 55 countries serving the needs of telecommunications companies, and supporting PT&T, commercial and military applications.

TCM-930 Specifications

GENERAL

Configuration Simplex or Duplex 1+0 with no external

branching. (Configurable up to 3+0 without

external branching.)

Transmission Capacity Up to 210 Mb/s of user data + user

service channels

Modulation TypesQPSK and 16 to 128 QAM. Programmable

with internal L-3 TW Modem

T/R Separation160 MHz minimum Frequency Selection Synthesizer controlled

Tuning Step SizeUp to 10 GHz, 250 kHz standard

Above 10 GHz, 500 kHz std., 10 kHz opt.

Tuning Time 60 sec

Control/DisplayLocal operation via front panel keyboard. Remote control available, 20-character by

4-line alphanumeric display on radio.

Internal Modem Features and Specifications

General Characteristics and Limitations

User Data I/O Rate Range ...19 to 210 Mb/s + user service channels User Data I/o Rate Range 19 to 210 Mb/s NRZ Clock and Data or **Direct Common Carrier Interfaces**

dependent on Emissions Bandwidth Limitations

Forward Error Correction

FEC CodingConvolutional/TCM, Reed Solomon, INTELSAT

Scrambler, INTELSAT Style Byte Deinterleaver

Receive Equalization Fast locking multi-tap adaptive equalizer

Spectral Shaping Root raised cosine

I/Q CorrectionAutomatic transmit I/Q imbalance

compensation, signal scaling and spectral

inversion correction

Down Conversion Digital with AGC, matched filtering, symbol

timing recovery and carrier synchronization

IF I/O Frequency 70.0 MHz

User Interfaces

Common Interfaces

Built-in voice link orderwire with call and call received functions

2 Duplex, Asynchronous RS-232 service channels up to 19.2 Kb/s each

OC-3, STM-1 Optical or STM-1 Electrical MULTI-CHANNEL -- Multiple I/O Programmable as 1 x DS3, 3 x DS3, 1 x E3, 3 x E3, 4 x

E3 or 3 x STS-1

ETHERNET -- Single, Duplex 100 Base-T

Electric

External Modem Interface (For use with factory qualified modems only)

(IF Transmit and Receiver)

Frequency70 MHz Level -9 to +6 dBm

Connector TNC(F)

(DC only Input standard, AC/DC Input optional)

AC Input Voltage100-260 Vac AC Input Frequency50/60 Hz (nominal)

Auto Switching When configured for AC and DC operation and

both AC and DC power are applied simultaneously, the radio will automatically switch between AC and DC power without any

interruption in service

Mechanical

(Nominal)

Orientation The radio must be stored, transported and operated in a horizontal position with the top

side up to meet the environmental

specifications as listed herein.

Transmit

Frequency Bands3.6-15.35 GHz in standard bands

RF Power Output (See Table A) RF Frequency Stability ± 5 ppm IF Frequency 70 MHz Spurious Emissions ≤ -65 dBc Harmonics ≤ -65 dBc

Receive

Threshold (1x10E-6)(See Table A)

Image Rejection> 70 dB

LO Leakage at Antenna

IF Frequency 70 MHz

IF 3 dB Bandwidth

Selectable on Radio

Keypad Narrowband: 30 MHz

Wideband: 40 MHz

IF Filter Type SAW

Environmental

Temperature Range

Operating-20° to +50°C -30° to +50°C optional

Storage -40° to +70°C

Humidity95% relative at 25°C (non-condensing)

operating

operated in the outdoors without the optional

protective front cover.

Vibration12-minute sine sweep (5-200-5 Hz) at

1.5 g's for six hours in vertical axis.

> duration when radio is packed in standard shipping container. Three shocks in vertical

axis.

Power Requirements

TABLEA

TABLE A						
	64 QAM		128 QAM		QPSK	
CONFIG.	POWER OUT	THRESHOLD 1x10E-6	POWER OUT	THRESHOLD (1x10-6)	POWER OUT	THRESHOLD (1x10-6)
Dual Pol	+28 dBm	-67.5 dBm	+25 dBm	-64.5 dBm	+31 dBm	-76 dBm
Single Pol	+28 dBm	-66.5 dBm	+25 dBm	-63.5 dBm	+31 dBm	-76 dBm

NOTE: Power Out is typical variation is + or -1 dB, threshold figures are guaranteed minimums.

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