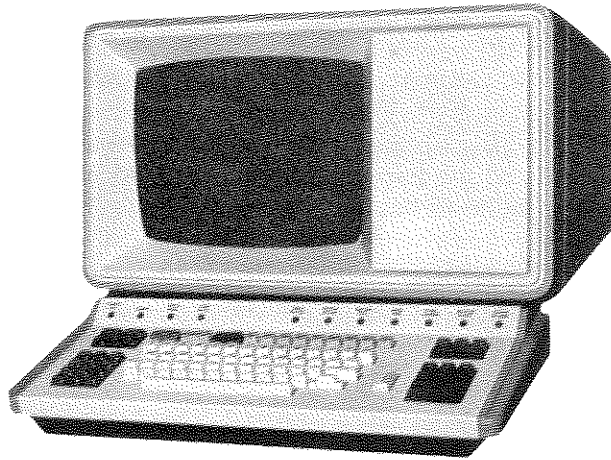


# TCS-10

## TRANSMITTER TERMINAL CONTROL SYSTEM



- \* *Continuous Readback Display*
- \* *24-Line 80-Character/Line CRT Screen*
- \* *Reliable Solid-State Modular Design*

The TCS-10 Transmitter Control System provides the means for controlling up to 20 co-located transmitters from a local or remote command site. Each system consists of 1) a high quality 80 x 24 CRT display screen; 2) a cluster keyboard\* with sequenced instruction lamps; and 3) a microprocessor with 4K memory that controls both the command and readback functions of the system. Two full-duplex input/output (I/O) ports are provided with each terminal: one for command/readback functions including auto-

- \* *Two Full-Duplex I/O Ports*
- \* *Microprocessor With 4K Memory*
- \* *20 Transmitter Control Capability*

matic polling and the second for by-passing the normal polling sequence in case a major fault is detected in any operating transmitter.

The microprocessor is completely solid state and designed specifically for handling high-volume data traffic continuously — 24 hours each day. Maximum use is made of removeable assemblies securely fastened to the main chassis yet easily released for servicing. This type design simplifies troubleshooting and ensures that the equipment is continually operational.

\* Full communications keyboard with cluster is optional.

## SPECIAL FEATURES

The TCS-10 transmitter control system provides for total command and readback of up to 20 co-located transmitters from a single terminal. It is a highly economical method of operating complete transmitter stations from a remote site. Many advanced features are integrated into the TCS-10 including completely solid-state circuits, precision clock control from highly stable crystal oscillators, and quality video display screens. Two input/output ports enable full duplex operation of the system and provide for instant recognition of a transmitter fault.

### COMPATIBILITY

The TCS-10 is fully compatible with TMC automated transmitters currently operating in the field. By using the TCS-10 terminals with an MMX or SBG synthesized exciter for RF drive, the capability of the transmitter system can be vastly improved at minimal cost. As a by-product of this conversion, the entire system becomes more economical to run since control can be centralized at one site and reliance on manual operations reduced.

### OPERATIONAL FEATURES

The TCS-10 is designed to operate 24 hours each day without interruption. Each terminal consists of a CRT display screen, microprocessor with memory, keyboard cluster for data entry, and a sequence of lamps to guide the operator through the programming of each transmitter selected. All operating transmitters are controlled through one TCS-10 terminal. No accessory equipment is needed except that required for microwave or other interface systems.

Operation of the TCS-10 is very simple since all commands are processed automatically. Each transmitter is electronically assigned one address code for identification. The operator calls this code and obtains a readback display of the status of the transmitter before programming begins. If the status indicates the transmitter is ready, the operator sequentially enters such information as operating frequency, mode, carrier suppression, output power level and antenna matrix position. The display data is verified and on command; transmitted to the equipment site at an 100-baud rate using a 5-level TTY code stream. It is then

decoded in the transmitter and the tuning cycle starts. Readback information is not displayed for the operator until the transmitter tuning cycle is completed. Once the readback display verifies the actual status of the transmitter controlled, high voltage is applied in preparation for keying information from audio terminal equipment.

### AUTOMATIC POLLING

A powerful feature of the TCS-10 is automatic polling of all transmitters under control. When the primary channel is inactive, each transmitter is addressed in sequence and status information transmitted back to the display screen. This process of refreshing data on the display is continuous and can be completed in less than 500 milliseconds for each transmitter. A second optional duplex channel can be provided to carry "crash" data that instantly detects a fault condition in any operating transmitter and relays the information to the operator for corrective action. Polling can be interrupted at any time but will resume from its last polling position when the primary channel is clear.

### RELIABILITY

The design of the TCS-10 is such that comparatively few parts are used to control many transmitter systems. The actual components used are standard and relatively simple to procure as replacement parts. As a result, the TCS-10 is considerably more reliable and less prone to deteriorate over long periods of use. The savings in maintaining an extensive parts inventory or in periodic servicing more than off-set the original cost of the equipment.

Circuits in the TCS-10 are completely solid-state, thereby reducing the complexity, size and power requirements of the system. Removeable circuit cards, securely fastened on slide retainers are interchangeable with other system cards and are totally accessible from the front of the terminal. Wherever practicable, TCS-10 components and construction are manufactured to U.S. MIL specifications. These features are a part of the TCS-10 and are designed to reduce downtime and virtually guarantee that the equipment is always available for service.

The technical specifications below describe TCS-10 transmitter control systems. TMC reserves the right to make engineering changes without notice.

## TECHNICAL SPECIFICATIONS

### CRT DISPLAY SCREEN

15" diagonal  
Bright green phosphor  
Anti-glare, non-reflective

### DISPLAY FORMAT

80 characters per line  
24 lines configured as follow:  
1 line Column Headings  
20 lines Transmitter Status  
1 line Text Editing  
2 lines Spacing

### DOT MATRIX

12 x 15 high resolution

### CHARACTER FONT

14 point upper case/CAIRO light

### KEYBOARD ARRAY

Multi-function cluster  
Optional: Typewriter or TTY

### KEYBOARD CONTROLS

NUMERIC 0-9  
ENTER/SKIP  
STANDBY/OPERATE  
RESET

### CONTROL CAPACITY

20 on-line transmitters

### STORAGE CAPACITY

Minimum: 4K

### INTERFACE

USASCII code, 5-Level  
Optional: 8-Level

### TRANSMISSION RATE

100 Baud FSK (STD TTY) Minimum

### CONTROL TIME (ONE CYCLE)

No Status Change 0.5 SEC MAX  
Status Change 2.5 SEC MAX

### INPUT/OUTPUT

One port for control/readback/polling  
Optional: Crash port for by-pass of normal polling sequence

### POLLING

Automatic interrogation and readback of each transmitter.  
Minimum 500 milliseconds/max 2.5 secs.  
Control of sequencing by terminal microprocessor.

## ENVIRONMENTAL AND INSTALLATION

### PRIMARY POWER

115/230VAC +/-5%  
50/60 Hz, single phase  
130 watts

### SIZE AND WEIGHT

17" high x 22" wide x 25" deep  
43.2cm x 55.9cm x 63.5cm  
84 pounds/38.2 Kg

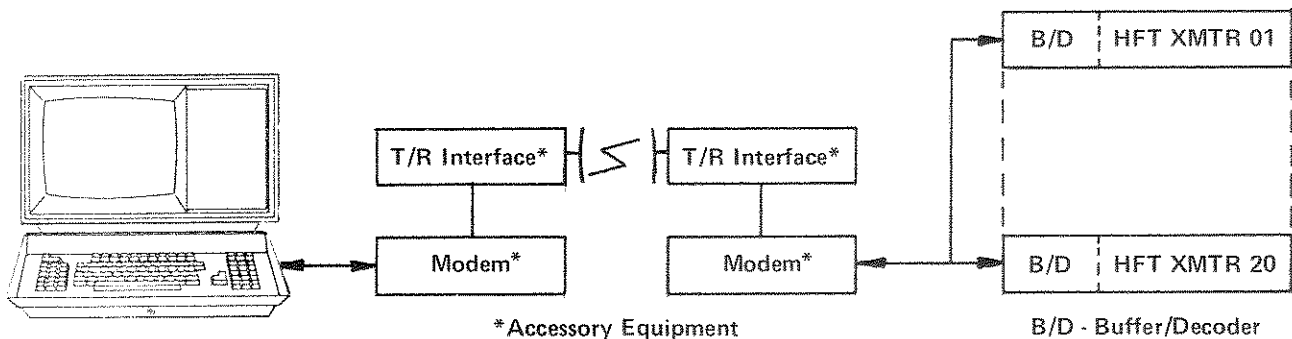
### ENVIRONMENTAL

Operating: 0°C to +50°C  
5% to 90% R.H.  
Storage: -30°C to +85°C, 90% R.H.

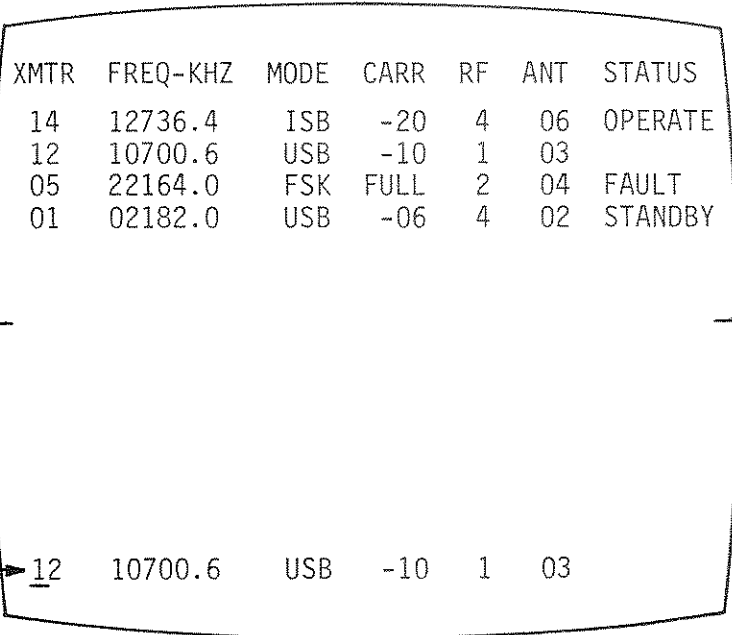
### SHIPPING DATA

Commercial packing for U.S. shipment  
Two (2) containers: Largest 32" x 32" x 26"  
Total weight/cube: 136/2.7 cu. ft.

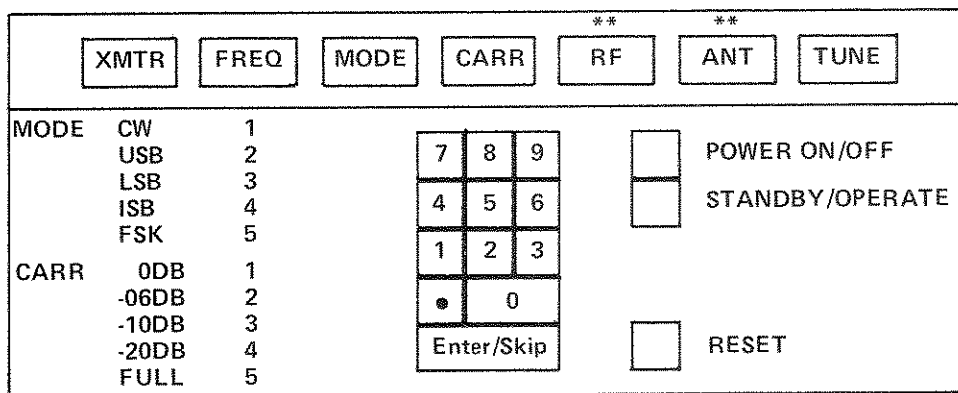
## TYPICAL INSTALLATION



DISPLAY



PROGRAM PANEL



**NORMAL OPERATING SEQUENCE**

PROGRAM PANEL	KEYBOARD OPERATION	DISPLAY
XMTR	Key in pre-assigned transmitter address; ENTER NOTE: Transmitter status displayed on EDIT LINE	2-digit number
FREQ*	Key in carrier operating frequency in KHZ; ENTER	6-digit number
MODE*	Key in number code for operating mode; ENTER	Word
CARR*	Key in number code for carrier suppression level; ENTER	2-digit number
RF* (Optional)	Key in number of pre-set RF power output level; ENTER	1-digit number
ANT* (Optional)	Key in pre-assigned antenna number for matrix switching; ENTER	2-digit number
TUNE*	Verify Edit Line data; ENTER	Blank edit line

NOTE: Program panel lamp returns to SELECT position and terminal is free to program other transmitters. Readback display automatically registers the status of the transmitter once tuning is completed. If a fault occurs, the appropriate status line will blink and display the word FAULT. An audible alarm will sound until the RESET key is depressed. Successful tuning of the transmitter will indicate on the display as STANDBY. To operate a transmitter by switching high voltage on, repeat SELECT operation and depress STANDBY/OPERATE key. Status will be displayed in less than one second depending on type modem and level of coding used.

\*Operation can be by-passed by depressing ENTER/SKIP key once. Status remains unchanged.

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