



GLOBAL MICROWAVE SYSTEMS, INC.
ST SERIES TRANSMITTERS
OPERATING GUIDE

SN: _____

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ST SERIES TRANSMITTERS OPERATING GUIDE

1.0 Introduction

The ST series transmitters are capable of transmitting analog FM microwave signals with one video channel and two audio subcarriers. They feature NTSC Video as standard with PAL and SECAM as factory options. Frequency, RF power output, and audio microphone or line level inputs are microprocessor controlled using the front panel push buttons. A one-line liquid crystal display (LCD) provides visual readouts of lock status, frequency, power output, and audio input level selection. As an additional feature, an RS-232 interface is provided for remote control of all of the transmitter functions. Connections to the transmitter are made through 3 standard connectors; a ten-pin PTO, a BNC, and an SMA.

2.0 Functional Description

2.01 Power

Power requirements are +11-15 VDC at between 1.2A - 1.8A typical. Connection to the transmitter is made through the ten-pin PTO connector. (See Section 4.0)

2.02 RF

The RF signal is supplied to the antenna through the SMA connector. (J3)

2.03 Audio

The ST series transmitters have two audio channels. Each channel is capable of being modulated by either a microphone input level (-54 dBm @ 600 ohms) or a line level input (0 dBm @ 600 ohms). Both audio channels are established as balanced inputs; although unbalanced inputs may be achieved by grounding the low side of the balanced input and applying the audio input signal to the high side of the balanced input. The audio inputs are accessible through the ten-pin PTO style connector. (See Section 4.0) Microphone or Line level of each audio channel is independently selectable via the front panel controls. In addition, the audio subcarriers can be turned off (usually used in repeaters).

2.04 Video

ST series transmitters have one video channel. The video input is 1Vpp into 75 ohms. The video input is accessible through the BNC (J1) or the ten-pin PTO connector. (See Section 4.0)

Composite Video input is available on Pin K of the ten-pin PTO connector. This input bypasses the video pre-emphasis network and it is normally used in microwave repeater configurations.

2.05 RS-232

An RS-232 interface is provided on all ST series transmitters. All transmitter functions are controllable via this interface with the GMS RCB-2000 Remote Control System. Access to this interface is provided through the ten-pin PTO connector. (See Section 4.0)

2.06 Front Panel

The front panel consists of an LCD with four push-buttons; UP, DOWN, CTRL, and ENTER. The front panel controls the transmitted frequency, RF power output and audio input level selection. The LCD displays the output frequency (or channel), RF power output and transmitter frequency lock status.

3.0 Front panel Operation

3.01 Power-Up

On power-up, the unit will display a pre-coded customer name and serial number, then set the channel to the one in use at last power-down. The display will look like this:

TX	CH A	HI
----	------	----

Where:

- TX = transmitter locked
- CH A = transmitter channel or frequency
- HI = transmitter output power level; ST, LO, HI

3.02 Front Panel Controls and Displays

The CTRL key selects the applicable transmitter control. For example, for each press of the CTRL key the transmitter control functions are selected as shown:

TX	CH A	HI
----	------	----

CHANNEL DISPLAY

CTRL pressed

POWER	<HIGH>
-------	--------

POWER OUTPUT

CTRL pressed

AUDIO 1	<MIC>
---------	-------

AUDIO 1 SOURCE SELECT

CTRL pressed

AUDIO 2	<LINE>
---------	--------

AUDIO 2 SOURCE SELECT

CTRL pressed

TX	CH A	HI
----	------	----

CHANNEL DISPLAY

3.03 Channel Display

In this mode, when the UP or DOWN key is pressed, the transmitter will step through the channels. On key release the display will blink for ten seconds. If ENTER is pressed before ten seconds, the transmitter frequency will be changed and stored in nonvolatile memory. If ENTER is not pressed before ten seconds, the display will stop blinking and the transmitter will reset to the previous frequency. The channel display and control functions are shown below:

TX	CH A	HI
----	------	----

UP	Increment channel.
DOWN	Decrement channel.
ENTER	Save channel.
CTRL	Change to POWER OUTPUT mode.

3.04 Power Output Display

The RF power output is selectable between three discrete levels, Standby (ST, no power output), Low (LO, approximately 0.25 or 0.10 Watts output), and High (HI, approximately 2.0 or 1.0 Watts output). The power output display and control functions are shown below:

```
POWER  <HIGH>  HI
```

UP	Toggle output level.
DOWN	Toggle output level.
ENTER	Return to DISPLAY CHANNEL mode.
CTRL	Change to AUDIO LEVEL ADJUST mode.

3.05 Audio Source Level Select

The audio source level is also selected from the front panel with the UP and DOWN keys. This control adjusts each input independently. When adjusting the level, the AUDIO 1/AUDIO 2 on the left of the display will blink indicating that a change in level is in progress. If ENTER is pressed, the new level will be stored. If CTRL is pressed before ENTER, the audio will be reset to the previous level. The audio source level is selectable from three discrete levels, OFF (no audio subcarriers), MIC (microphone audio source), LINE (line level audio source). Audio level displays and control functions are shown below:

```
AUDIO 1  <MIC>
```

UP	Toggle audio 1 level.
DOWN	Toggle audio 1 level.
ENTER	Save audio 1 level.
CTRL	Change to AUDIO LEVEL 2 ADJUST mode and cancel audio level changes if A1 flashing.

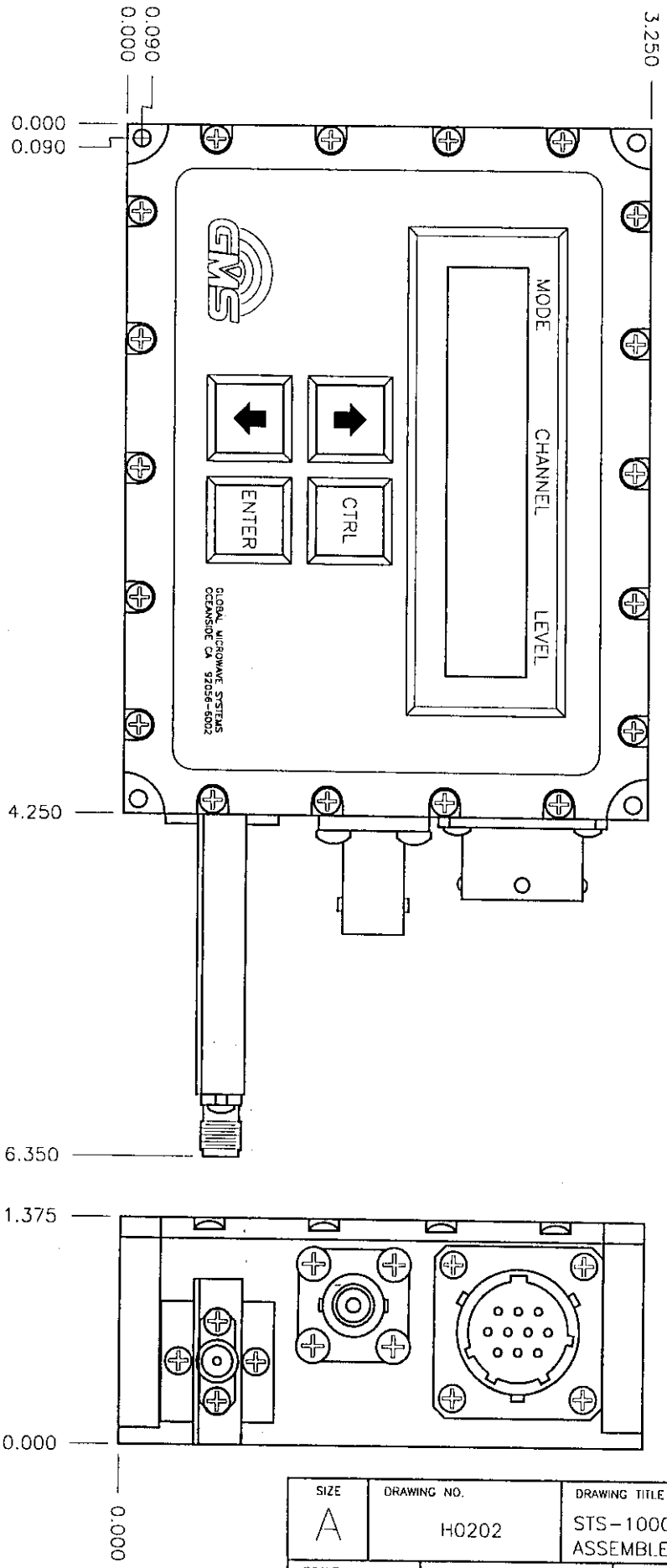
```
AUDIO 2  <LINE>
```

UP	Toggle audio 2 level.
DOWN	Toggle audio 2 level.
ENTER	Save audio 2 level.
CTRL	Change to CHANNEL DISPLAY mode and cancel audio level changes if A2 flashing.

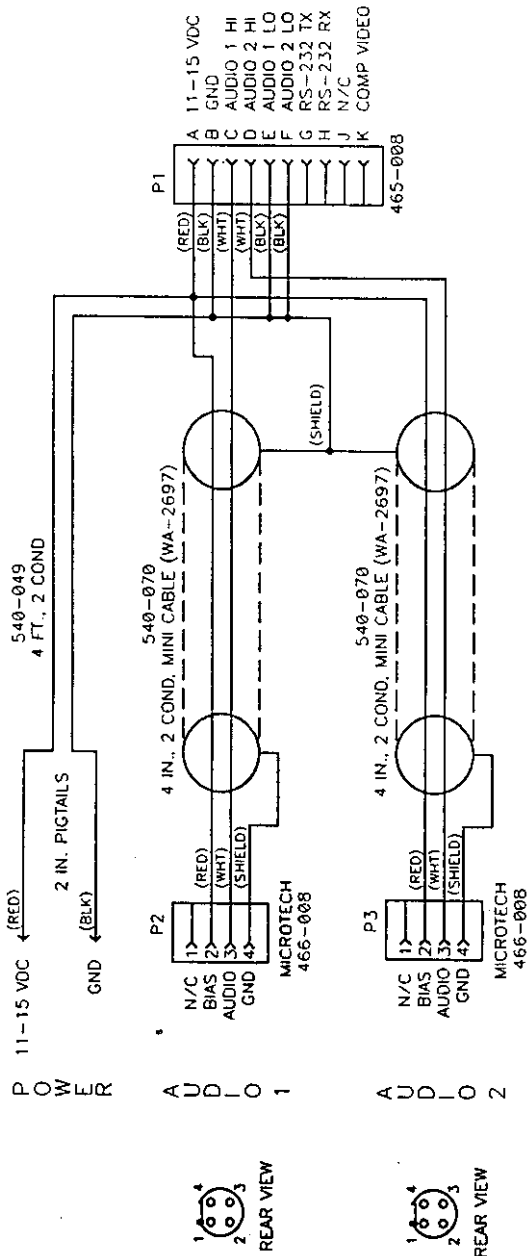
4.0 Interface

The following shows the pin-out of the ten-pin PTO connector:

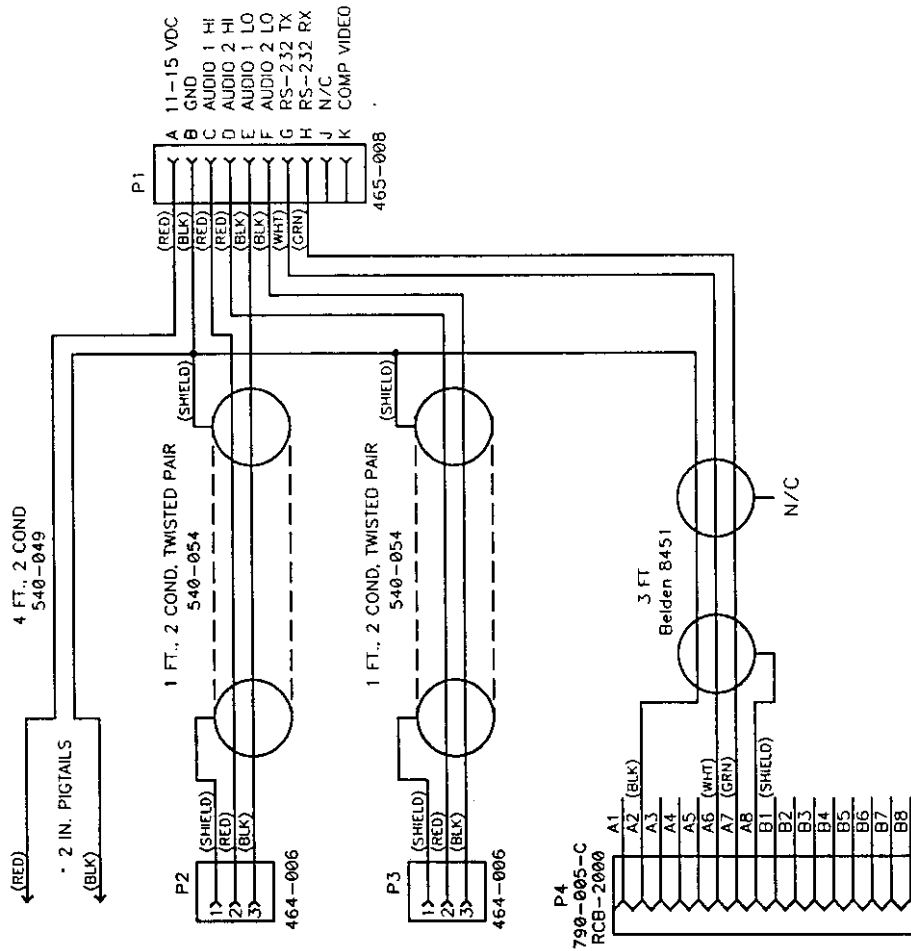
<u>PIN#</u>	<u>DESCRIPTION</u>
A	+11-15 VDC
B	GROUND
C	AUDIO 1 LOW INPUT
D	AUDIO 2 HIGH INPUT
E	AUDIO 1 LOW INPUT
F	AUDIO 2 LOW INPUT
G	RS-232 TRANSMIT
H	RS-232 RECEIVE
J	NO CONNECTION
K	COMPOSITE VIDEO INPUT



SIZE A	DRAWING NO. H0202	DRAWING TITLE STS-10000 TRANSMITTER ASSEMBLED DRAWING		
SCALE 1=1	DATE 08/13/97	SHEET 1 OF 1	DRAWN BY	APPROVED BY



SIZE	DRAWING TITLE	LAYOUT	PCB
A	ST SERIES XMITTER, POWER CORD	N/A	N/A
	10P PTO - 4P FM MICROTECH PLUG	DRAWING	BOM
		S0103	780-0025-00
DATE	SHEET	DRAWN BY	APPROVED
	11/08/96		



SIZE	DRAWING TITLE	LAYOUT	PCB
A	ST SERIES TRANSMITTER, POWER CORD 10 PIN PTO - 3 PIN FM XLR PLUG RCB-2000 RS-232	N/A	N/A
DATE	SHEET	DRAWING	BOM
08/06/97	08/06/97	S0144	780-0041-00
		DRAWN BY	APPROVED