

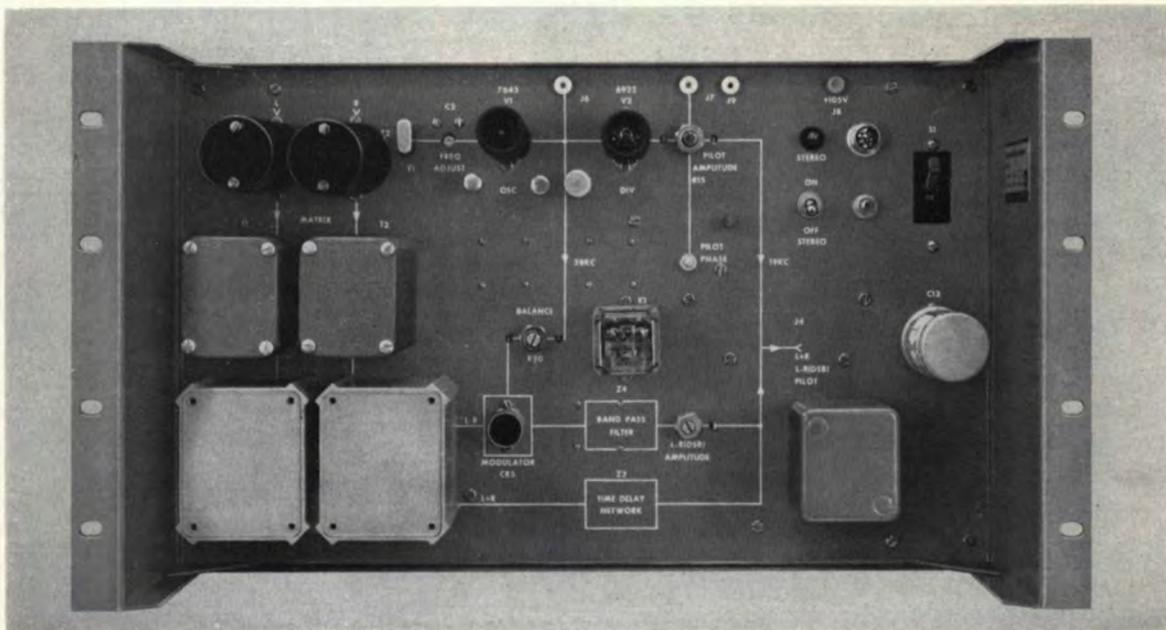


# STEREO SUBCARRIER GENERATOR

TYPE BTS-1A

CATALOG

B.6553



## FEATURES

- High quality FM Stereo performance
- Plug-in pre-emphasis units
- Built-in matrix
- Hermetically sealed silicon diode power supply
- Temperature stability  $-20^{\circ}$  to  $+45^{\circ}\text{C}$
- Mono-stereo relay and indicator included
- Minimum adjustments

## USES

The RCA Type BTS-1A Stereo Subcarrier Generator, MI-560001, is an all new improved unit, designed for high quality FM stereo operation. The generator produces a composite signal which is fed into the "Direct FM" exciter, BTE-10B, or its predecessor, MI-7016.

All RCA FM transmitters incorporating the BTE-10B Exciter can be used for simultaneous stereo and SCA transmission using the BTS-1A Stereo Subcarrier Generator in conjunction with a BTX-1A SCA Subcarrier Generator. If, however, stereo and SCA service are transmitted simultaneously, a filter, MI-560003, will be required at the output of the BTX-1A to make certain all spurious signals are attenuated at least 60 db at 53 kc and below. Earlier RCA FM transmitters incorporating the MI-7016 Exciter may be used for stereo transmission using the BTS-1A. Simultaneous SCA service is not feasible, however, if the MI-7016 Exciter is used.

## DESCRIPTION

The BTS-1A Stereo Subcarrier Generator was designed and built after stereo experience had been obtained from the use of its predecessor, Type BTS-1. The BTS-1A incorporates a simple, easy-to-follow circuit with a minimum of adjustments resulting in continued reliability and stability. It is designed for remote control operation, and in many instances can be mounted in the transmitter cabinet or in any adjacent 19-inch rack.

Only two long life (10,000 hours) premium tubes, a 7643 and a 6922, are used in the BTS-1A. Frequency stability is maintained with a 38 kc oscillator having an accuracy of  $\pm 2$  cycles. The power supply consists of hermetically sealed silicon diodes. All parts are designed for conservative operation for maximum reliability. Plate voltage on the tubes is only 100 volts.

A matrix and time delay circuit are incorporated in the BTS-1A. The two stereo signals from the studio, L (left) and R (right), are fed into the matrix to obtain sum and difference signals. The difference signal is amplitude, suppressed carrier modulated.  $L+R$  and  $L-R$  (DSB) and pilot signals are added to form the composite signal which will frequency modulate the exciter (BTE-10B or MI-7016). The double sideband signal (DSB) is generated in a ring modulator, which consists of four matched germanium diodes in one assembly. The diodes all have identical electrical characteristics regardless of temperature. The signal-to-noise ratio and distortion levels are the same

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for monophonic and stereophonic transmission. The L-R Signal at the output of the ring modulator is fed through a bandpass filter and added to the L+R signal.

The BTS-1A has a frequency response of 30-15,000 cycles,  $\pm 1.5$  db. Distortion (90 per cent main channel modulation by a L-R signal) is 1 per cent or less. The signal-to-noise ratio under the same conditions as above is a maximum of -60 db. Total distortion of a composite signal (45 per cent L+R and 45 per cent L-R) (DSB) modulation will not exceed 0.75 per cent.

The BTS-1A Stereo Subcarrier Generator is designed to fit a standard 19-inch rack, and is only 10½ inches high. It offers utmost accessibility. To get at the back, all that is required is to remove a dust cover. There are four test points on the front panel for ease of servicing. There are only four screwdriver adjustments in the BTS-1A: ring modulator balance, L-R (DSB) amplitude, pilot amplitude, and pilot phase. There is one additional adjustment for matrix balance, that is set once at the factory for better than 50 db balance (the unwanted channel rejected 50 db or more).

The BTS-1A incorporates a switch for monophonic or stereophonic operating modes (local or remote operation). There is an indicator lamp on the BTS-1A to show when it is in the stereo mode. When operating remote control, the monitor or receiver at the studio will indicate the unit is operating by reception of the 19 kc pilot tone. When remote control over telephone lines is desired, the BTR-11A or BTR-20A remote control equipment should be used.

Power supply requirements for the generator are 117 or 208-240,  $\pm 11$  volts, 50/60 cps. Ambient temperature

range is -20 to  $\pm 45$  degrees, Centigrade (same wide ambient specifications as for any current RCA FM transmitter), which means that no special heating or cooling requirements are necessary for the transmitter area.

## SPECIFICATIONS

### Electrical

Pilot Carrier Stability.....	19 kc $\pm 1$ cps
Subcarrier Suppression.....	1% or better
Frequency Response, 30-15,000 cycles.....	$\pm 1.5$ db
Pre-emphasis.....	75 $\mu$ sec.
Peak Modulation Capability of DSB Signal.....	$\pm 100$ kc or better
Separation (BTS-1A and BTE-10B).....	30 db or better
Crosstalk (main channel to subchannel).....	50 db or better
Crosstalk (subchannel to main channel).....	50 db or better
Harmonic Distortion (90% main channel modulation by L-R).....	1% or less
Signal-to-noise Ratio (90% main channel modulation by L-R).....	-60 db
Line Voltage Requirements.....	117 or 208-240 $\pm 11$ volts, 50/60 cps
Power Consumption.....	10 watts

### Mechanical

Temperature Range.....	-20 to +45 degrees C.
Altitude.....	7,500 feet
Finish.....	Umber gray
Dimensions.....	10½" high, 19" wide, 8¾" deep (excluding plugs)
Weight.....	25 lbs.

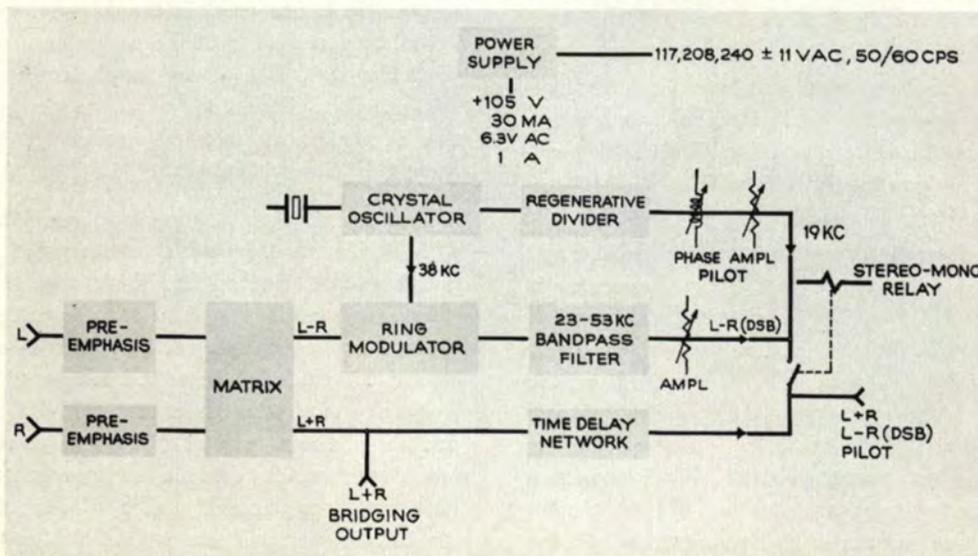
### Equipment Supplied (ES-560202)

Type BTS-1A Stereo Subcarrier Generator complete with pre-emphasis network, connectors, plugs and electrolytic capacitor.....	MI-560001
Input Adaptor for BTE-10B.....	MI-560004

### Accessory Equipment

Set Spare Tubes for BTS-1A.....	MI-560005
53 kc filter for use with BTS-1A when transmitting stereo and SCA service.....	MI-560003

## BLOCK DIAGRAM BTS-1A STEREO SUBCARRIER GENERATOR



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