

SUMMARY OF DATA

PURPOSE

To provide an automatically tuned, independent sideband, transmitter drive equipment for HF and limited MF transmission in Integrated Communication System Stage 2.

BRIEF DESCRIPTION

The Modulator-Tuning Unit comprises two functional entities, the Modulator and the Tuning Unit Drive. The Modulator generates ssb signals from keyed tone or speech inputs to produce a modulated 100 kHz sub-carrier, Tuning Unit Drive tunes automatically to this frequency and amplifies and filters the rf signal from the Synthesizer to produce the drive output.

AF inputs, selected by front panel switches, are inhibited by transistor switching until the automatic tuning sequence is completed. Depending on the class of transmission selected they are then routed by diodes through the upper and lower sideband circuits. The usb and lsb signals are applied to identical audio amplifiers which incorporate volume compression and peak clipping circuits. Balanced modulators, driven by 100 kHz from the Frequency Synthesizer, accept the audio outputs and yield two double sidebands with the carrier suppressed. Sideband selecting filters, using crystal resonators, select the upper and lower sidebands which are then combined to produce the modulated 100 kHz output to the Frequency Synthesizer. The carrier is re-inserted when required for pilot carrier, compatible dsb or mcw operation. On usb only a keyed 1 kHz tone, derived from the Synthesizer, provides an alternative af input to speech.

The Synthesizer generates output frequencies, selected by five decade controls, from an accurate input frequency of 1 MHz which is usually supplied by Frequency Standard Outfit FSA. Frequency conversion is accomplished by regenerative divider circuits and triple-mix frequency multipliers. The modulated 100 kHz sub-carrier is translated to the selected output frequency at a level of about 10 mW.

The Tuning Unit Drive uses linear amplifiers and filters to build up the rf signal from the Frequency Synthesizer to a final output level of about 100 mW.

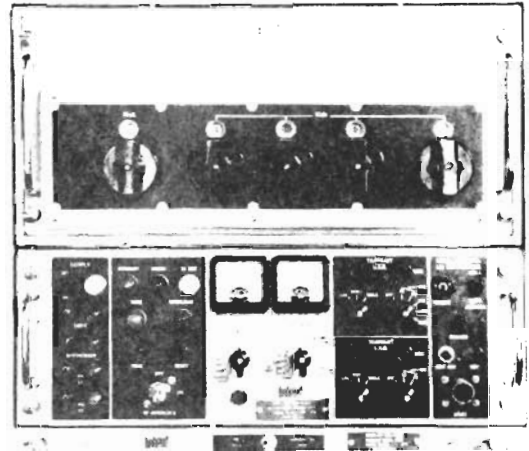
Frequency is covered in six ranges. Depending on the setting of the Synthesizer controls, a rotary solenoid system automatically selects a set of three band-pass filters for the appropriate range and servo-driven capacitors tune the selected filters to the required frequency. The filters reduce wide-band noise and spurious emissions. Three wide-band amplifiers are used to compensate for the insertion loss of the filters and to raise the rf signal level.

Binary dividers control an attenuator for automatic level control. A stepped attenuator enables the drive output to be controlled manually by a local or a remote switch.

Where no Monitoring Assembly is fitted the Panel, Signal Distribution, Radio provides a means of tuning the band suppression filters of Outfit EZ(4), using an Outfit TDC for the rf drive.

CLASS OF TRANSMISSION

- 1. Modulation: AM
- 2. Types of transmission: CW (1 kHz tone keyed in usb)
MCW (1 kHz tone keyed in usb and carrier)
Telephony
- 3. Supplementary Characteristics:
ssb (or lsb) Suppressed Carrier
ssb (or lsb) Pilot Carrier
Compatible dsb (Carrier and usb only transmitted)



FREQUENCY RANGE

- HF 1 to 27.5 MHz
- MF 240 to 525 kHz

MAJOR ASSEMBLIES AND PHYSICAL DATA

	Height	Width	Depth	Weight
Cabinet, Drive Unit 5820-99-519-6982	48.2 cm (19 in.)	55.9 cm (22 in.)	59.1 cm (23.25 in.)	46.4 Kg (103 lb)
Synthesizer, Electrical Frequency 5820-99-519-7000	23.8 cm (9.375 in.)	50.2 cm (19.75 in.)	57.6 cm (22.625 in.)	27.2 Kg (60 lb)
Modulator — Tuning Unit 5820-99-519-6983	17.8 cm (7 in.)	50.2 cm (19.75 in.)	57.6 cm (22.625 in.)	26.3 Kg (58 lb)
Panel, Signal Distribution, Radio 5820-99-521-4828	15.2 cm (6 in.)	15.2 cm (6 in.)	22.2 cm (8.75 in.)	30 Kg (8 lb)

ELECTRICAL CHARACTERISTICS

- 1 MHz standard frequency Input : 0.5 V to 1 V into 75 ohms or more than 1 kohm.
Audio Inputs: : At two remote inputs, 1 mV \pm 1 dB into 600 ohms at 1 kHz for peak sideband output on either sideband.
At local input, -50 dBm for peak sideband output on either sideband.
- RF Output Level : 100 mW PEP into 75 ohms. Internal alC maintains output within \pm 1 dB. Output attenuator locally or remotely controlled, up to 31 dB in steps of 1 dB.
- Frequency stability : Same as 1 MHz standard.
Volume Compression (VOGAD) : Operates at Input levels above the 1 mW standard, resulting in progressive attenuation of up to 12 dB as the Input is increased by 15 dB.
- Limiters: : Increase of line input by 20 dB relative to standard 1 mW increases output < 3 dB.
- Sidetone Output : Source Impedance 180 to 200 ohms. Delivers 2 to 3 V into 200 ohm load with 1 mW standard input to the channel at 1 kHz.
- Keying : Earthing the key line sets output to "mark" condition. Maximum acceptable speed in CW Telegraphy is 30 bauds.

POWER REQUIREMENTS

100 to 130 V or 200 to 260 V, 50 to 60 Hz single-phase ac
Voltage adjustment in steps of 5V.
Consumption: 180 W max.
115 V or 230 V ac or dc 50 W for anti-condensation heaters.

HANDBOOKS

- BR 4219
BR 4146 Handbook for Synthesizer, Electrical Frequency 5820-99-519-7000.
BR 4145 Handbook for Modulator — Tuning Unit 5820-99-519-6983

ESTABLISHMENT LIST

E 1527

INSTALLATION SPECIFICATION

B 1084