Marconi I.F Equipment for Satellite Communications

The Marconi Company has a wide experience in the design of multichannel communication systems, and designs are available for the various units needed for the transmit and receive i.f paths in satellite earth stations.

FEATURES

Change of receive i.f filters can easily be made.
Plug-in group delay cards.
Cable equalizer system.

Equipment

Transmit and Receive I.F Amplifier

Three basic designs are available for use as required to build up any i.f system. The pre-i.f amplifier uses low noise transistors to give wideband gain with very little noise addition. The buffer amplifier uses microminiature cascode modules to provide gain with good isolation. The main i.f amplifier uses microminiature cascade modules, variable loss attenuators and a high level amplifier to provide manual or automatic gain variation over a wide bandwidth without passband distortion.

Group Delay Equalizer

This unit enables the group delay distortion of the transmit or receive i.f chain to be equalized in terms of the slope or parabolic curvature of the delay characteristic. This is done by using plug-in cards with a range of volts in both the 'slope' and 'curvature' sockets in the unit. Isolation and amplification is provided by amplifiers and attenuators within the unit. The cards contain passive networks of the correct characteristics accurately set in final production test.

I.F Filter

This is used in the receiver to select the desired carrier from those adjacent, and in the transmitter to avoid interference with adjacent carriers. The necessary band rejection is obtained by the use of two 6-element maximally flat filters, each being separately equalized for group delay and amplitude distortion. The units are in module form and can be readily changed when the channel capacity is altered.

DATA SUMMARY

I.F Amplifier
Frequency: 70 MHz.
Bandwidth to 0·5 dB: 40 MHz.
Impedance: 75 ohm.
Return loss: 26 dB.
Gain: 10, 20 or 40 dB.

Group Delay Equalizer
Frequency: 70 MHz.
Equalization bandwidth: 20 MHz.
Impedance: 75 ohm.
Return loss: 26 dB.
Delay slope: $\pm 0{\cdot}5$ nsec MHz max.
Delay curvature: 0·1 nsec MHz^2 max.

I.F Filter
Frequency: 70 MHz.
Passband: To suit 24–132 channels.
Stopband: 25 dB at adjacent carrier frequency.
Impedance: 75 ohm.
Return loss: 26 dB.

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