'Autoplex' Equipment HU 120 Series

AUTOPLEX is a time-division multiplex system with automatic error detection and correction. A seven-unit error-detecting code is employed in conjunction with a repetition cycle in accordance with CCIR Recommendation No.242 (Los Angeles 1959). The system is synchronous, transmission speed being controlled by a highly stable crystal oscillator.

Autoplex has been continuously developed over several years and the HU 120 series equipments are up-to-date transistor versions of the original HU 20 series. Operation is in accordance not only with Recommendation 242, but also Report 108 (Los Angeles 1959), permitting automatic phasing in traffic without loss or multiple printing of characters.

The basic terminal operates with a tape reader (or similar) input but, in conjunction with auxiliary units, telex and leased private circuits may be provided.

The HU 120 series comprises the main terminal equipment, Type HU 121, and a range of auxiliary units offering additional facilities.

Features

Single-switch selection of operation as: (a) one four-channel system, (b) two independent two-channel systems.

Tested repetition cycle reduces undetectable error rate by forcing a further repetition cycle unless *all* characters in the RQ cycle are correct.

Fully automatic phasing in traffic without loss or duplication of characters in an average of four seconds.

Marking of the aggregate signal by an inversion pattern in accordance with CCIR Report No.108 (Los Angeles 1959) can be switch-selected.

Accurate synchronism *under all conditions*. Even prolonged failures of the radio path do not result in loss of synchronism.

Sub-division of channels obtained by plugging additional units into the main equipment.

Full compatibility. Autoplex is able to operate with any other error-correcting multiplex equipment which conforms to international standards (CCIR Recommendation No.242). The advantage of rapid, fully automatic phasing and the tested repetition cycle are obtained even when working with equipment of less advanced design.

Transistors and a modular form of construction are used throughout, resulting in excellent reliability, low power consumption and easy maintenance.

Any unit may be withdrawn and operated in an extension frame for servicing.

Error Detection and Correction Terminal Type HU 121

The basic 2+2-channel terminal is housed in a single front-access cabinet and is built up from a number of narrow units arranged in rows, book-shelf fashion. Each book unit contains a number of small printed-wiring modules. Each module performs a basic logic function and the equipment is made up of a large number of modules of comparatively few types. One shelf contains book units on which are mounted most of the operational controls. Also on this shelf are two units which provide visual indication, switched on a channel basis, of 5-unit and 7-unit signals being transmitted or received.

Alternative units are available to provide simultaneous outputs from the receiver instead of the normal sequential outputs.

Data Summary

5-unit input: Multi-wire simultaneous, controlled by stepping pulses; ±6 V on five traffic wires, on 6th wire for 'no traffic', on 7th wire for supervisory condition.

5-unit output: ±6 V or ±80 V start/stop; distortion less than 3%.

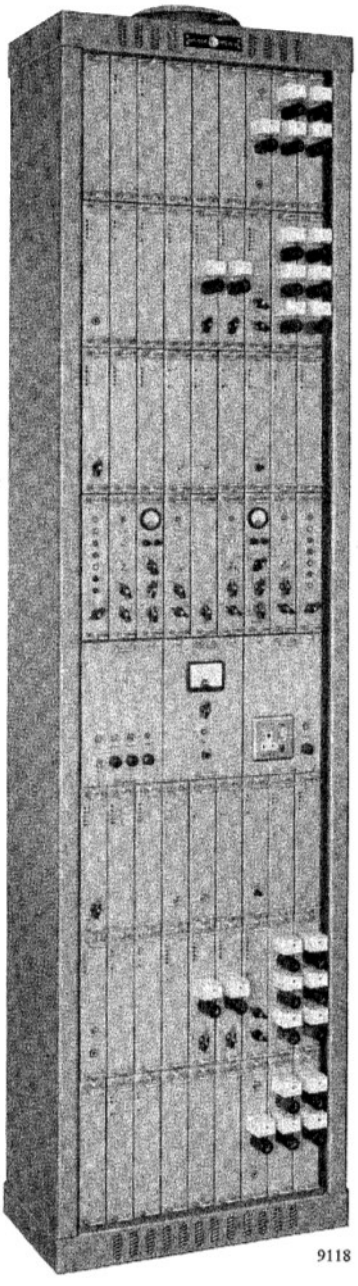
7-unit aggregate input: ±6 V into 1 kΩ or ±80 V into 4 kΩ, sequential; margin better than ±45%.

7-unit aggregate output: ±6 V or ±80 V sequential; distortion less than 3%. Polarities of signals are reversible to conform to any desired convention.

Working speeds (bauds):

5-unit signal	7-unit aggregate signal	
	2-channel	4-channel
50	96	192
50 or 45·5	85⅞	171⅜

Storage: One store per channel, capable of



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HU 121 Terminal Equipment.

storing the 3 or 4 characters required for 4 or 8-character repetition cycles (idle beta used for 'packing' characters).

Power supplies: 100–125 V or 200–250 V 45–65 c/s, single-phase AC. 80–0–80 V DC if required.

Power consumption (AC): Less than 150 W.

Dimensions:

Height	Width	Depth	Weight
7 ft 6 in. (228·6 cm)	1 ft 11½ in. (59·7 cm)	1 ft (30·5 cm)	300 lb (163·4 kg)

Sequential-to-Simultaneous Converter
Type HU 123

In order to apply a start/stop input signal to a radio channel using Autoplex, it is necessary to convert the sequential input to the simultaneous form required by the HU 121. The input is normally from an autosender, the characters being released by pulses sent from the converter but timed by the HU 121.

The converter comprises three book units, each containing printed-wiring modules, designed for mounting in an auxiliary cabinet matching the main equipment.

FEATURES

Input loop delay of up to 290 milliseconds can be accommodated.

Means are included for detecting the supervisory conditions, continuous start and stop polarity, and translating them to idle-alpha and idle-beta signals.

Short start-element rejection, to avoid the possibility of short interference pulses causing false starts.

Choice of two keying speeds by switch selection.

Data Summary

Input: ±6 V into 1 kΩ or ±80 V into 4 kΩ start/stop.

Output: Suitable for Type HU 121 channel input.

Keying speed: 45·45 or 50 bauds.

Auto-transmitter release pulse: ±6 V or ±80 V double current, with or without 40 ms delay.

Power supplies: 10–0–10 V from supply units in auxiliary cabinet.

Channel Sub-divider
Type HU 125

When the volume of traffic on a private or leased circuit does not warrant full-time occupation of an Autoplex channel, a number of customers may share the channel by means of a channel sub-divider.

This divides the main channel into two, three or four sub-channels. One sequential-to-simultaneous converter must be used for each sub-channel.

The channel sub-divider comprises two book units and facilities are provided in the HU 121 equipment for one sub-divider to be added for each of the four channels.

FEATURES

Sub-channel distribution is entirely electronic; switched selection of sub-channel combinations is arranged in accordance with CCITT recommendations as follows.

(a) 4 quarter-speed channels
(b) 2 quarter-speed channels and 1 half-speed channel.
(c) 2 half-speed channels
(d) 1 quarter-speed channel and 1 three-quarter-speed channel.

Automatic phasing in conjunction with the marking pattern set out in Report 108 has been used to provide correct sub-channel phase automatically.

Data Summary

Sub-channel inputs: Multi-wire simultaneous from up to four sequential-to-simultaneous converters.

Sub-channel outputs: ±6 V or ±80 V start/stop.

Auto-transmitter release pulse: ±6 V double-current.

Power supplies: 10–0–10 V from supply units in main equipment cabinets.

Seven-unit Monitor
Type HU 126

This is a self-contained test instrument for monitoring the seven-unit sequential signals employed in error correcting multiplex equipment. Any signal complying with the international standard (CCIR Recommendation No.242), which is based on the Van Duuren system, may be monitored, irrespective of the make and type of terminal equipment used. The monitor does not require an external oscillator. A suitable seven-unit printer for use with the monitor is the Siemens Halske Type Tempf 41(c) which can be supplied or, alternatively, may be obtained direct from the manufacturer.

FEATURES

Fully automatic phasing to the signal.

The monitor is capable of selecting any channel of a 2-channel or 4-channel multiplex signal or any sub-channel where sub-division is employed.

Transistors are used throughout.

The unit is self-contained and contains its own power supply unit for operation from AC mains.

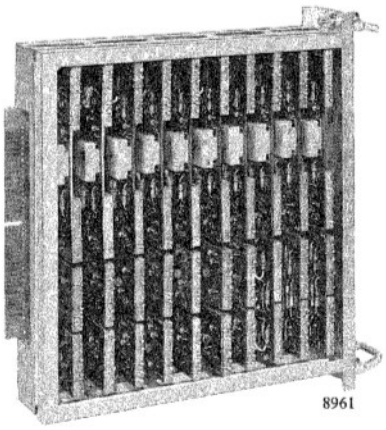
Data Summary

Input: 7-unit sequential aggregate signal; ±6 V to ±80 V into 40 kΩ.

Keying speed: 85½, 96 or 100 bauds aggregate signal for 2-channel; 171½, 192 or 200 bauds aggregate signal for 4-channel.

Output: Printing on paper tape using a 7-unit printer.

Power supplies: 100–125 V or 200–250 V, 45–65 c/s, single-phase AC.



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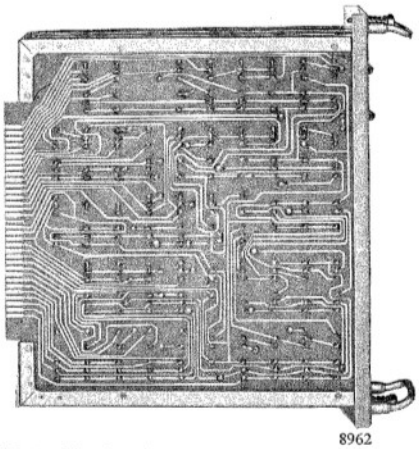

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Typical book unit.

Marconi

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