

Recommendation M.520**ROUTINE MAINTENANCE ON INTERNATIONAL GROUP,
SUPERGROUP, ETC., LINKS****1 Type of routine tests**

Only measurements of the pilot level are made on international group, supergroup, etc. links. These do not involve other stations. Therefore, Administrations are free to decide on the methods and periodicities. In order to ensure that the performance limits of the links laid down in Recommendation M.160 are met, the following tests are recommended for consideration.

2 Links without an automatic regulator

At control stations routine measurements should be made of the pilot level. The periodicity of these routines may be weekly or monthly depending on the complexity of the routing and constitution of the link.

3 Links with an automatic regulator

At control stations where a regulator is installed, the level at the input and output of the regulator, if these measurement points are provided by the equipment, may be measured every six months.

4 Continuous recording of pilot level

In addition to the above it is useful to be able to take continuous pilot-recordings as required to detect fault conditions which do not trigger the normal alarm systems.

Recommendation M.525**AUTOMATIC MAINTENANCE PROCEDURES FOR INTERNATIONAL
GROUP, SUPERGROUP, ETC., LINKS****1 General**

In order to reduce corrective maintenance and minimize preventive maintenance in accordance with Recommendation M.20 the routine measurements of group, supergroup, etc. links may be carried out by automatic measurements without interruption.

Such routine measurements, where provided, should be for the same characteristics given in Recommendation M.460, e.g. overall loss, random noise, etc.

The decision to use automatic measurement procedures and the determination of intervals between routine measurements are matters for agreement by the concerned Administrations.

The need for readjustment based on the results of these measurements should be determined according to Recommendation M.530.

2 Frequencies and levels of test signals

The recommended frequencies for overall loss measurement are given in Table 1/M.525. The maintenance measurements can be made at some or all of those frequencies.

The test frequencies for group, supergroup, etc. links are chosen to fall between channels, groups, supergroups, etc. These frequencies are shifted at ± 80 Hz with respect to 4 kHz multiplied frequencies to avoid carrier leaks and other spurious tones interference. The automatic measurement equipment usually makes use of pre-defined software and/or hardware.

Test frequencies for supermastergroups are not shifted at ± 80 Hz, as they are located in wide guard intervals and do not coincide with carrier leaks and pilot frequencies.

Test frequencies 9008 kHz, 11 096 kHz and 11 648 kHz given in Recommendation M.460 should be shifted to avoid interferences between supermastergroup and mastergroup No. 7 and No. 9 pilot frequencies (see Recommendation M.350).

Test signal levels should generally not exceed -20 dBm0. A level of -10 dBm0 may be used for master and supermastergroup measurements. When the measurement of Group No. 3 (see Recommendation M.330) is being made, the test signal at 103.92 kHz has to be blocked, otherwise it is necessary to make the correction for the loss at the frequency 103.92 kHz, caused by the 411.86 kHz reject filter.

TABLE 1/M.525

Frequencies of test signals

Type of link	Frequencies (kHz)
Supermaster group	8516.3*, 8760, 9004, 9256, 9504, 9792, 10 080, 10 324, 10 576, 10 824, 11 150, 11 400, 11 644, 11 896, 12 144, 12 387.4*
Master group	812.6*, 871.92, 931.92, 1055.92, 1179.92, 1303.92, 1427.92, 1555.92, 1675.92, 1799.92, 1923.92, 1983.92, 2043.7*
Supergroup (4 kHz channels)	312.3*, 320.08, 328.08, 344.08, 360.08, 376.08, 392.08, 408.08, 432.08, 456.08, 472.08, 488.08, 504.08, 520.08, 536.08, 544.08, 551.4*
Group (4 kHz channels)	60.6*, 63.92, 67.92, 71.92, 75.92, 79.92, 83.92, 87.92, 91.92, 95.92, 99.92, 103.92, 107.7*

Note — As a rule the frequencies marked by an asterisk (*) cannot be used for measurements without traffic interruption. These frequencies may be used in the absence of traffic in the edge channels or a low level of test signal (below -45 dBm0).

Recommendation M.530

READJUSTMENT TO THE NOMINAL VALUE OF AN INTERNATIONAL GROUP, SUPERGROUP, ETC., LINK

1 General

Before any adjustment is made to a link it must first be ensured that each regulated line section or higher-order link over which the link concerned is routed is correctly adjusted and that the level of the reference pilot at the transmitting end is correct. No readjustments will be made on the link except under the direction of the control station, after consideration of measurement results.