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AUTOMATIC TELEGRAPH CROSSBAR ATA-NK-2 QUALITY
REQUIREMENTS OF CERTIFIED PRODUCTS(U) FOREIGN
TECHNOLOGY DIV WRIGHT-PATTERSON AFB OH 10 FEB 83

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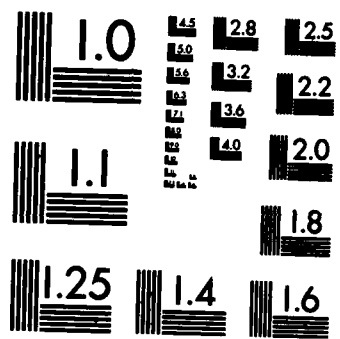
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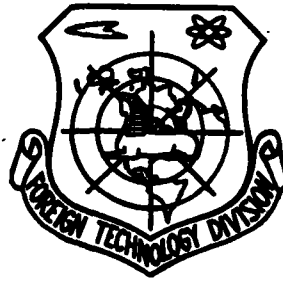
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FTD-ID(RS)T-1774-2

FOREIGN TECHNOLOGY DIVISION



AUTOMATIC TELEGRAPH CROSSBAR ATA-MK-2.
QUALITY REQUIREMENTS OF CERTIFIED PRODUCTS



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EDITED TRANSLATION

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AUTOMATIC TELEGRAPH CROSSBAR ATA-MK-2. QUALITY REQUIREMENTS OF CERTIFIED PRODUCTS

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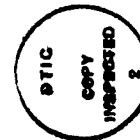
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U. S. BOARD ON GEOGRAPHIC NAMES TRANSLITERATION SYSTEM

Block	Italic	Transliteration	Block	Italic	Transliteration
А а	<i>А а</i>	A, a	Р р	<i>Р р</i>	R, r
Б б	<i>Б б</i>	B, b	С с	<i>С с</i>	S, s
В в	<i>В в</i>	V, v	Т т	<i>Т т</i>	T, t
Г г	<i>Г г</i>	G, g	У у	<i>У у</i>	U, u
Д д	<i>Д д</i>	D, d	Ф ф	<i>Ф ф</i>	F, f
Е е	<i>Е е</i>	Ye, ye; E, e*	Х х	<i>Х х</i>	Kh, kh
Ж ж	<i>Ж ж</i>	Zh, zh	Ц ц	<i>Ц ц</i>	Ts, ts
З з	<i>З з</i>	Z, z	Ч ч	<i>Ч ч</i>	Ch, ch
И и	<i>И и</i>	I, i	Ш ш	<i>Ш ш</i>	Sh, sh
Й й	<i>Й й</i>	Y, y	Щ щ	<i>Щ щ</i>	Shch, shch
К к	<i>К к</i>	K, k	Ъ ъ	<i>Ъ ъ</i>	"
Л л	<i>Л л</i>	L, l	Ы ы	<i>Ы ы</i>	Y, y
М м	<i>М м</i>	M, m	Ь ь	<i>Ь ь</i>	'
Н н	<i>Н н</i>	N, n	Э э	<i>Э э</i>	E, e
О о	<i>О о</i>	O, o	Ю ю	<i>Ю ю</i>	Yu, yu
П п	<i>П п</i>	P, p	Я я	<i>Я я</i>	Ya, ya

*ye initially, after vowels, and after ъ, ь; e elsewhere.
When written as ë in Russian, transliterate as yë or ë.

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	sinh ⁻¹
cos	cos	ch	cosh	arc ch	cosh ⁻¹
tg	tan	th	tanh	arc th	tanh ⁻¹
ctg	cot	cth	coth	arc cth	coth ⁻¹
sec	sec	sch	sech	arc sch	sech ⁻¹
cosec	csc	csch	csch	arc csch	csch ⁻¹

Russian English

rot curl
lg log

GRAPHICS DISCLAIMER

All figures, graphics, tables, equations, etc. merged into this translation were extracted from the best quality copy available.

ALL-UNION STATE STANDARD [GOST] 5.1709-72

AUTOMATIC TELEGRAPH CROSSBAR ATA-MK-2.
QUALITY REQUIREMENTS OF CERTIFIED PRODUCTS

By decree of the State Committee on Standards of the USSR Council of Ministers dated 20 November 1972, No. 2087, the periods of introduction is established beginning 01.01.73

This standard is extended to the automatic telegraph crossbar station of the type ATA-MK-2 which is intended for the automatic switching of the lines of local subscribers and long-distance telegraph channels as well as lines of local subscribers between each other with the giving to the subscribers temporary telegraph connections on networks of telex service (AT) or direct connections (PS).

Subscriber units should be included in the station over one-, two-, or four-conductor lines and voice-frequency telegraphing channels (TT) are used as connecting lines to higher stations.

The station is installed in rayon communication centers as a terminal station.

Station ATA-MK-2 has been awarded the state Mark of Quality in the established order.

1. Basic Parameters and Dimensions

1.1. The basic parameters of the station should correspond to the following:

Capacity:

subscriber units	from 10 to 20
channels to higher stations	from 4 to 8
directions of transmission	2
rate of telegraphing, Baud	50
current strength in subscriber loop, mA:	
at rest	3-8
operating	20-60
Overall dimensions, mm, no more than:	
rack for ATA-MK-2	750x2500x300
switchboard RK-3	450x340x310
Weight, kg, no more than:	
rack for ATA-MK-2	240
commutator RK-3	25
set EKR-ATA-MK-2	20
set EK-ATA-MK-2	0.5
set KM-ATA-MK-2	32

An example of the conventional designation of an automatic telegraph crossbar station:

Station ATA-MK-2 GOST 5.1709-72

(Changed wording - "Information Index of Standards", No. 12, 1975).

2. Technical Requirements

2.1. Station ATA-MK-2 should be manufactured in accordance with the requirements of this standard and the technical documentation approved in the established order.

2.2. Power supply voltage, V:

from dc sources with grounded middle point	±60
from ac source	220

Fluctuations in power supply voltages should be in accordance with the requirements of GOST 5237-69.

2.3. The voltage of radio interference and the intensity of the field of radio interference created by the station should not exceed the values indicated in norms 9-72, "All-Union Norm for Permissible Industrial Radio Noise," approved by the State Commission on Radio Frequencies of the USSR of 12 June 1972.

(Changed wording - "Information Index of Standards," No. 12, 1975.)

The distortion of telegraph pulses in the rack and switchboard with a telegraphing rate of 50 Baud should be no more than 2%.

2.5. The duration of a ringing signal perceived by the circuits of the subscriber set (AK) and the adapter (PU) is 100-300 ms.

2.6. The duration of the delay for the drop-out of relay V in the AK and PU - 0.5-2.0 s.

2.7. Delay in triggering relays KZ and PU - 45-200 ms.

2.8. Delay in drop-out of relay NK2 in PU - 1.5-3.0 s.

(Changed wording - "Information Index of Standards," No. 12, 1975.)

2.9. Relay OT in PU should perceive the first signal of the response from the higher station with a duration of 17.5-35.0 ms. The adapter should relay the second signal of the response to the subscriber.

(Changed wording - "Information Index of Standards," No. 12, 1975.)

2.10. Duration of signals "Answer of Station" formed in PU and register - 20-35 ms.

(Changed wording - "Information Index of Standards," No. 12, 1975.)

2.11. The duration of the "Busy" signal sent toward the calling subscriber or higher station:

from the register - 140-260 ms;
from the PU - 140-360 ms.

2.12. Forced freeing of the register with its nonproductive holding should occur after (5-15) ± 0.5 s.

2.13. The station should ensure the reception of pulses from the dialing of the number which have the following parameters.

With interaction with register-free stations:

rate, pulse/s	10 \pm 1
pulse coefficient	1.3-1.9
interseries time, ms.....	360-370

With interaction with register stations:

rate, pulse/s	12.5 \pm 0.12
pulse coefficient.....	1

2.14. With a break or shortcircuit of the subscriber line or failure to receive an answer signal from a higher station optical and acoustic signaling should be turned on.

2.15. The total time for occupying a register finder when establishing one connection - 200-300 ms.

2.16. The repetition frequency of the pulses which arrive in the subscriber counters, pulses/m:

For zone I (up to 600 km):

with the normal charge rate.....	2
with special reduced rate.....	1

For zone II (greater than 600 km):

with the normal charge rate.....	6
with special reduced rate.....	3

2.17. The delay in the drop-out of relay VI of the pulse device and relay SZ of the register - 300-500 ms.

2.18. Duration of current pulses which arrive at relay I1 and I2 of the pulse device - 0.8-1.2 s.

2.19. The total operating time of relay O of the distributing unit with the freeing of the unit - 150-350 ms.

2.20. The duration of the pulse perceived by relay OT of the manual switchboard - at least 20 ms.

(Changed wording - "Information Index of Standards," No. 12, 1975.)

2.21. The duration of delay in the drop-out of relay OT of the manual switchboard - at least 1 s.

(Changed wording - "Information Index of Standards," No. 12, 1975.)

2.22. The duration of delay in the drop-out of relay VVP of the manual switchboard - at least 200 ms.

2.23. The insulation of lead-out circuits in relation to the frame should withstand an effective voltage of 500 volts ac with a frequency of 50 Hz with disconnected filters at the telegraph relays and circuits which have a galvanic contact with the frame of the rack for 1 min without breaking down.

2.24. Resistance of the insulation:

on the assembly boards - at least 50 M Ω ;
on the rack and switchboard - at least 3 M Ω .

2.25. The station should meet the requirements of this standard and should have no mechanical damage, weakening of the fastenings, trouble in the operation of the control elements, or damage to the assembly and parts after transportation in package form over cobblestone and dirt roads at a speed of 20-40 km/h over a distance of at least 200 km.

(Changed wording - "Information Index of Standards," No. 12, 1975.)

2.26. The station should maintain its effectiveness for work in rooms with an air temperature of from +5 to +40°C and after a stay in a nonoperating state at temperatures from -50 to +50°C.

(Changed wording - "Information Index of Standards," No. 12, 1975.)

2.27. The probability of establishing connections under plant tests of the station should be at least 0.998 with a test reliability of 99% and a relative error equal to 1.

(Changed wording - "Information Index of Standards," No. 12, 1975.)

2.28. Station service period should be at least 15 years.

3. Requirements for Safety and Production Sanitation

3.1. Current-conducting parts which are accessible to chance contact with the maintenance personnel should be closed by hatches.

3.2. AC lead-ins and motors of the pulse device should be protected by insulation shutters which have warning signs.

3.3. The construction should ensure electrical contact between the assembly boards with relays, relay housings, and the housing and contact of the electrical grounding of the rack and switchboard with an impedance of no more than 0.1 Ω .

3.4. The contact of the electrical grounding should have a reliable electrical connection with the housing of the rack with a contact impedance of no more than 0.05 Ω .

(Changed wording - "Information Index of Standards," No. 12, 1975.)

3.5. A check of the strength of insulation should be accomplished by workers who have a qualification group on accident prevention no lower than IV.

4. Completeness of Set

4.1. The station set should include:
rack ATA-MK-2 - 1;
spare parts set - 1;
switchboard RK-3 - 1 per 2 racks;
maintenance-repair set EKR-ATA-MK-2 - 1 per 5-10 racks;
maintenance set EK-ATA-MK-2 - 1 per 2 racks;
assembly set KM-ATA-MK-2 - 1 per 2 racks. Maintenance documentation is attached to the set.

5. Rules for Acceptance

5.1. For the check for conformance to the requirements of this standard the stations should be subjected to the following tests: acceptance, periodic, standard, and reliability.

5.2. Acceptance test.

5.2.1. During acceptance tests, each station is subjected to a check for conformance to the requirements of points 2.1, 2.2 (with a nominal value of power supply voltages), 2.5-2.12, 2.14-2.24, 3.1, 3.2, 4.1, 7.1-7.7 in any sequence.

5.2.2. On obtaining unsatisfactory results from the tests in even one of the points listed in paragraph 5.2.1, the station must be returned to disclose the reasons for the flaw and for its elimination.

If the defects which has been discovered is common to all stations, the check of the subsequent stations should be accomplished only after the defects have been eliminated.

After the elimination of the defects, repeated testings of the stations are accomplished in accordance with paragraph 5.2.1.

5.2.3. With the repeated discovery of the nonconformance of the station to the requirements of this standard, they are returned and the tests are stopped.

5.3. Periodic tests

5.3.1. Periodic tests are conducted at least once per year. One station selected by the method of random selection from a batch which has undergone acceptance tests is subjected to the tests.

5.3.2. Periodic tests are conducted for conformance to the requirements of points 2.2, 2.4, 2.13, 2.25-2.27, 3.3, and 3.4.

With unsatisfactory results of periodic tests in even one of the points, the acceptance of the stations should be stopped until the elimination of the defects which have been discovered.

(Changed wording - "Information Index of Standards," No. 12, 1975.)

5.3.3. After elimination of the defects which have been discovered, twice the number of samples are subjected to the tests.

It is permitted to conduct repeated periodic tests which are not complete test but only tests in those points for which unsatisfactory results have been obtained.

The results of the repeated tests are final.

5.4. Standard tests

5.4.1. Standard tests are conducted with a change in the schematic diagram, design, and technology in the manufacture of the station as well as in the materials which are employed and the component parts which influence the parameters of the station.

5.4.2. One station is selected for standard tests by the random selection method.

5.4.3. The volume of standard tests is determined by agreement between the manufacturing enterprise, developer, and customer.

5.5. Reliability tests

5.5.1. Reliability tests are conducted at least once every three years on one rack which has undergone acceptance tests.

6. Test Methods

6.1. All tests are conducted under normal climate conditions: ambient temperature from +15 to +35°C, relative humidity of the air from 45 to 80%, and atmospheric pressure from 680 to 800 mmHg (GOST 15150-69).

6.2. The check for the conformance to requirements of points 2.1, 3.1, 3.2, 4.1, and 7.1-7.7 is conducted by an external inspection, comparison with specifications and drawings, and by the measurement of dimensions with an accuracy required by the drawings.

6.3. The check for the conformance to the requirements of point 2.2 is conducted by a functional test of the rack and switchboard with the use of special test units which ensure a check of the functional ability and measurement of the required value.

6.4. The check for the conformance to requirements of point 2.3 is conducted in accordance with the procedure and with the instruments indicated in GOST 16842-71 and in standards 9-72.

(Changed wording - "Information Index of Standards," No. 12, 1975.)

6.5. The check for conformance to the requirements of points 2.4-2.22 is accomplished by methods and using instruments which ensure measurement accuracy with an error of no more than 10%.

6.6. The check for conformance to the requirements of point 2.23 is accomplished using an ac breakdown unit with a frequency of 50 Hz and power on the output of at least 0.5 kV·A. It is permitted to perform the check for one second with a voltage increased by 25%.

6.7. The check for conformance to the requirements of point 2.24 is conducted with an ac voltage of 100-200 V by an instrument which ensures an accuracy of measurement with an error of no more than 10%.

The resistance of the insulation is measured after the test in accordance with point 2.23.

6.8. The check for conformance to the requirements of point 2.25 is conducted by transporting the station in its packaging on motor vehicles at a speed of 20-30 km/h over a distance of 200 km on roads with an unimproved surface.

6.9. The check for conformance to the requirements of point 2.27 is conducted with the rated voltage of the power supply sources on a test bench in the following manner:

a) the establishment of check connections is conducted, including at least:

2360 local connections (236 connections each from each subscriber line), equipment;

235 outgoing and incoming connections through each adapter;

b) with the establishment of the check connections, the number of unestablished connections N_1 and the total number of connections N are recorded. The ratio of N_1/N should be no more than 0.002;

c) prior to the check, the rated strengths of operating currents and quiescent currents are established in the subscriber devices;

d) the parameters of the dialing pulses during the check should be:

$$\begin{aligned} t_{\text{ИМЛ}} &= 40 \pm 2 \text{ ms,} \\ t_{\text{ИМТ}} &= 60 \pm 3 \text{ ms.} \end{aligned}$$

(Changed wording - "Information Index of Standards," No. 12, 1975.)

6.10. The check for heat resistance (point 2.26) is conducted in a heat chamber in the following manner.

The assembly boards are placed in the chamber, a temperature of $+40^{\circ}\text{C}$ is established, and subsequently it is maintained with an error of $\pm 3^{\circ}\text{C}$ (relative humidity is not regulated).

After establishing a heat balance through the entire volume of the assembly boards they are kept in the chamber for 4 hours.

After holding at a temperature of $+40^{\circ}\text{C}$ the boards are turned on, an external inspection is performed, the functional ability is checked, and the resistance of the insulation is measured for conformance to point 2.24. The check for functional ability is conducted without removing the boards from the chamber.

If the check and measurement of the insulation resistance without removing the boards from the chamber is impossible, it is permitted to perform the check and measurement within 10 minutes after removing the boards from the chamber.

The temperature in the chamber is raised to $+50^{\circ}\text{C}$ and subsequently maintained with an error of $\pm 3^{\circ}\text{C}$ (relative humidity is not regulated).

After establishing a heat balance throughout the entire volume of the boards they are kept in the chamber for 4 hours and then removed from the chamber.

Four hours after the establishment of the heat balance, an external inspection is conducted under normal climate conditions, functional ability is checked, and the resistance of the insulation for conformance to point 2.24 is measured.

The check for cold resistance (point 2.26) is performed by testing the boards in a cold chamber in the following manner.

The boards are placed in the chamber and a temperature of $+1^{\circ}\text{C}$ is established in it, and subsequently it is maintained with an error of $\pm 3^{\circ}\text{C}$ (relative humidity is not regulated).

After the cooling of the boards through the entire volume, they are kept in the chamber for 4 hours.

After holding at a temperature of $+1^{\circ}\text{C}$ the boards are turned on, an external inspection is conducted, the functional ability is checked, and the resistance of the insulation for conformance to point 2.24 is measured.

The functional test is performed without removing the boards from the chamber. If the check and measurement of the insulation resistance are impossible without removing the boards from the chamber, it is permitted to perform the check and measurement within 10 minutes after removing the boards from the chamber.

The temperature in the chamber is reduced to -50°C and is subsequently maintained with an error of $\pm 3^{\circ}\text{C}$.

After the cooling of the boards through their entire volume they are kept in the chamber for 4 hours in a non-operating state at a temperature of -50°C , after which the temperature in the chamber is raised to the normal at a rate of $1-2^{\circ}\text{C}/\text{min}$ and the boards are removed from the chamber.

Four hours after establishing a heat balance under normal climate conditions an external inspection of the boards is conducted, their functional ability is checked, and the resistance of the insulation for conformance to point 2.24 is measured.

6.11. The check in accordance with points 3.3 and 3.4 is accomplished by measuring the electrical impedance by any instruments which ensure a measurement accuracy with an error of no more than 10%.

7. Marking, Packaging, Transportation, and Storage

7.1. A strip with the following placed on it by the photo-chemical method should be fastened to the front panels of each rack and the switch:

the state Mark of Quality in accordance with GOST 1.9-67;
the trade mark of the manufacturing enterprise;
type of article;
designation of this standard;
ordinal number of the article;
year and month of production.

7.2. The name of the station should be placed on the front of the rack on the upper right-hand door by the silk-screening method.

7.3. The name of the switchboard should be placed on the front panel of the switchboard in the lower right-hand corner by the silk-screening method.

7.4. Transportation packaging - board boxes in accordance with GOST 10198-71. Bituminous and tar packing paper in accordance with GOST 515-56 or another material equivalent in moisture resistance and mechanical strength should be laid inside the box.

7.5. Prior to packing in the board boxes the articles should be wrapped in two-layer waterproof packing paper in accordance with GOST 8828-61 or another which is equivalent to it in moisture resistance and mechanical strength.

7.6. The marking of the transportation packaging should correspond to GOST 14192-71.

7.7. The conditions for transportation of stations as pertains to the effect of climate factors should correspond to the requirements of GOST 15150-69 in accordance with the group of storage conditions Zh2.

7.8. The stations should be stored in accordance with the requirements of GOST 15150-69 for the group of storage conditions L.

8. Manufacture's Guarantee

8.1. The manufacturing enterprise should guarantee the conformance of station ATA-MK-2 to the requirements of this standard with the user's observance of the operating conditions and conditions for transportation and storage established by the standard.

The guaranteed period of operation is established at 36 months from the day of putting into operation.

(Changed wording - "Information Index of Standards," No. 12, 1975.)

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