A Powerful PABX of Telephone Exchange System

PROGRAM-CONTROL TELEPHONE EXCHANGE

TC-212  2  LINE  12  OUT
TC-312  3  LINE  12  OUT
TC-412  4  LINE  12  OUT
TC-216  2  LINE  16  OUT
TC-316  3  LINE  16  OUT
TC-416  4  LINE  16  OUT

Specification & Instruction Manual
Brief Instruction

Phone out: To dial a number directly.
Switching: To dial the number of extensions (801~ 816) directly.
Interphone: To dial “*” first, and than to dial the extension number
8 telephone are working at the same time is allowed. Including calls out and calls in for outside phone, speaking, switching, and calls for inside phone, speaking.

I. Brief introduction.
Welcome to use our stored program controlled electronic telephone switching system. (Or called group telephones, hereinafter referred to as Switchboard). Please read the specification sheets clearly and tasting the commodity and function of our goods.
You will draw a conclusion that you have a good switchboard when you use the goods for a long time.
With emphasis on design, quality and function, our brand will grow up in the world. All the integrated circuit and component of this Switchboard is supplied by the famous chip factory of the world or the international certificate factory. Since the design of the goods collected the latest product of today’s science and technology, and with discard the useless and accept the good, the characteristic is practical and durable, it nestle up against the lift and work.
The signal processing and discriminator technology of our goods is able to work in difference standard of the outlying district. This Switchboard can fit the adverse circumstances, such as anti-interference, fight the thunder and lightning.
Several patent technologies of our goods are the representative of advanced level and tide in the world. LAW PROTECTS INTELLECTUAL PROPERTY, VIOLATORS MUST BE BROUGHT TO JUSTICE.
With the strict quality control, the yield of our goods is more than 99%, and our target is 100%. At present, the reprocessed products is less than 2%, including mistake in working by user, and our target is zero in this part.
“DUO LU TONG” switchboard have several series and different grade in style, you will have a satisfactory choice.
If you have any good idea or unsatisfactory, please inform us, we will make our work better, and make it be an international brand in the future. And let’s share the proud and honour.
Thank you for your sensible choice.
Thank you for your cooperation.

II. Product Installation testing and Basic Operations Attention Terms
1. Wall built-up and put in the table-board are both ok, and it should be installing in the place will firm, drying, and aeration.
2. Wiring should be kept away from electromagnetic interference, such as motor, transformer. For the normal operation, the wiring must be installed firm and select and use the products of telephone. If disconnection or short-circuiting, it will out of using.
3. In raining, wiring is strictly prohibited.
4. The sequence of the extensions accessing the exchange is as follow: if the outside lines are vacant, access the No.1 outside line with priority, then No.2 outside line, and No.3 and No.4 in turn; so the busiest outside line shall be accessed to No.4 outside line, then No.3, No.2 and the last No.1. Thus the effect upon the busy outside line due to the occupation by exchange can be prevented.

2.01 Install the connection
No installation drawings are necessary. Insert the outside lines to the telecom bureau as the LINE1~ LINE4 on the shell, insert the arranged extensions upon the 801~816 sockets, and insert the power line. It is simple and no sequence is required. If the power indicator is not on or just flashes for several times after the power is turned on, it has been inserted improperly. If it keep on all the time, please contact the distributor. It is normal if it flashes. It is so visual.

2.02 Return to the factory status
Format: *#1000
Status: Manual duty mode implies the No.2 extension as an extension on duty. There is no limit to every extension and no free-disturbance set.

The order shall be operated by No.1 extension. If it is the first time, then shall key “*#1000” by the No.1 extension on power, about in 2 seconds, hearing a sound of “du”, which indicates that all the irreleative data canceled, which are imbedded while your purchasing. If you forget the imbedded data or want to make a whole change, then you can input this order by No.1 extension again.

2.03 Dial inside and outside call and identify
To any extension with no limit of outside call, pick it up then the indicator lamps of the outside line and the telephone light with the low and deep dialing tone, at this time you can dial the outside party’s number or dial the redial key. (To the imported or introduced mode, you always dial “0” and “9” first to put through the outside call).

If call inside line, press “*”, the outside line indicator lamp goes out with the clear inside line dialing tone, then key the inside call number to enter into the inside call. If the switch board doesn’t connect outside line, dialing inside call only needs to input the extension number (801~816). The extension with the limit of dialing outside call, off hook and you will hear the inside dialing tone to enter into the inside call. You can judge it is outside call or inside by the signal tone to every extension with limitation of the outside call dialing. To the extension without limitation of outside call dialing, pick it up and hear the inside dialing ton or busy tone, which indicates that all the outside line occupied or the call quality can’t be limited by the outside line distance as well as put any effects to the telecom bureau. The inside call doesn’t need to pay.

2.04 Choose outside line and test
Format: *90W   W=1.2.3.4
Every extension can choose the outside line with permission to call the outside party. Pick it up and key the above order, input the number when hearing the reopen outside dialing tone, if the line busy hold on, repeat the above operation of dial the redialing key. If hearing the inside lines busy tone, then the outside line occupied or the extension not allowed to use this outside line.
Furthermore, the order can test if every outside line works or not.
Example: Use an extension near to the main board with outside call unlocked to test the No.4 outside line. Pick it up and key the “*904” when hearing the dialing tone, the indicator lamp lights and hear the low and deep dialing tone, which indicates it works. If the lamp doesn’t light and hear the inside line busy tone, it doesn’t work. Then test the outside line broken or not, or cut off, or something wrong with jack. This order offers a very convenient way to the user for self-testing.

2.05 Forced insert

“*90W” order for the 801 extension. By this order you can forced insert a certain outside line in connection as well as outside line choosing function. To ensure that the VIP’s communication connected. Meanwhile, you can monitor the other extension in purpose of private calling preventing, which will affect the working efficiency and add the telephone charge. 801 extension shall be controlled by the factory’s director, manager or supervisor.

2.06 Replacement of outside call dialing

Format: “#*8ab”   ab=01~08~10~16

The extension puts through a outside call, input this order the can call the other extension to connect the outside line, which is very applied to the busy factory’s director and managers’ who ask the secretary to dial call, so it is also called secretary phone.

It is also suitable for the hotel, in which the outside line in the room locked, if the guest needs, the extension of the front desk will act for him.

2.07 Transfer, consult, multi-transfer, wait with music, automatically ring-bank

Outside call needs to transfer, then dial the transferred number directly, operation as follows:

1. The transferring party holds on the line when hearing the short reminding tone. At the same time, the transferred party in an inside connection will hear a short on-hook urging tone, he hangs off in 10 seconds and the ring rings. The transferring party hears the ring-back, while the outside party waits with music. If the transferred party doesn’t hang off in 10 seconds, the transferring party will return to the outside line to ask the caller to dial after a which or dialing continually to urge the transferred party on-hook.

2. Hearing the ring-back, the transferring party hangs off, the outside party listens to the music, the transferred party rings, pick up to connect the outside party.

3. Hearing the ring-back, the transferring party hangs off, the outside party listens to the music, the transferred party rings sand doesn’t pick up in 20 seconds, then automatically ring-back in order to avoid the outside call broken.

4. Hearing the ring-back, the transferring doesn’t hang off, the outside listens to the music, the transferred rings and doesn’t hang off in 20 seconds then the transferring reconnect with the outside party.

5. Hearing the ring-back, the outside listens to the music, the transferring doesn’t hang off, the transferred rings, picks up and connect the transferring. The transferring or the transferred hangs off, then the other party connects the outside.

6. There is no limit of transferring number and the status as the above mentioned.

2.08 Answering
When outside call in-com e or transferring, pick up the extension and key “*7”, then you can answer it. Add after that you can transfer, which makes the answering more convenient.

2.09 Automatic error correction
The system can identify automatically if you key the wrong extension number when transferring or inside calling. You just have to input the correct number.

2.10 Special number opening
You can dial some emergency number such as 119, 110, 120, 122, and 112, free of charge by and extension with no limit of outside line at any time.

2.11 Unblocked, multi-cord
The extension duty will hear the urging on-hook tone when all the extensions are in the inside connection while the outside call coming, which will protect the in-come call connected.

2.12 Group call and multi-communication (telephone call)
1. The operation must be implemented by the on-duty extension
   a. The No.2 extension is the on-duty extension when out of the factory.
   b. Any extension can be set up as the on-duty extension by the No.1 extension with this order.
      ab=01~08~10~16
2. Group call
   a. Dial “*200” by extension on duty, then all the extensions on-hook ring on every other one and half seconds except the No.1 extension. The extension on duty hares the ring-back. The extension in connection hears the urging on-hook tone, hangs off the rings with the other extensions.
   b. The extension can connect the extension on duty when off-hook. Rings for eight times and stop. The extension on duty can check the extensions off-hook or not.
      If the extension on-hook takes part in, then dial “*2ab” continually, such as “*204” “*207” “*215”. And the extension will ring for eight times continually.
   c. If the No.1extension needed, dial “*201” and is available after the ring.
   d. All the extensions in connections hear the urging on-hook tone when the outside call in-come, the extension on duty or the extension without free-disturbance set hang off, wait ring to pick up to put through the outside line.
   e. Allow any extension quit the connection.
3. Multi-group and multi-party communication
   a. Dial “*2ab” continually by the on-duty extension. There is no limit of quantity in sixteen sets.
   b. If one more wanted while a group is in connection, then the extension on duty hangs off and repeat the above-mentioned operation.
   c. In sixteen sets, there is no group limit, only repeat the mentioned action.

III. The system function and built-out
3.1 Ring protection
The most of the users are used to pick up the receiver when ring. The alternating voice will be produced at this moment in the old and inferior switchboard. It sounds
uncomfortably and easily hurts the telephone set. So special design is used on this switchboard, canceling alternating voice when ring and the user picks it up, and there is no need for the user to do nothing.

3.2 Automatically identify outside line and the number
The switchboard can identify whether or not there is outside line on any jacks. You plug and use and can judge how many there are outside lines. Extension picks up then enter into the free outside line to dial the outside number directly. If the extension locks the outside line or the line occupied, then enter into the inside call only. The user can know the status of the extension to make a choice according to the different signal tone transferred by the telephone. If selected lines order used, the switchboard can judge whether or not this jack has outside lines or occupied or not, and send the different signal tone.

3.3 The outside line no answering allowed
There is no need for setting. At this moment inside call is allowed only. Allowing several extensions to dial simultaneously (it’s so if there is outside lines). Your calling at any time can be assured, unlike the other poor switchboard, which the one extension can’t call until the other complete calling.

3.4 Telephone
All of the extensions use the double audio frequencies telephones, except which there is no other special needs for the imported and home-made telephones, the inherent functions of the telephones remind unchanged. But in order to ensure your quality of communications, try to use home-made telephones which marked “on net”.

3.5 Can link to the any telecom terminal equipment
The jack of any extensions can link to telephone, fax machine, message machine or computer. Their original functions remain unchanged.

The connected computers can be linked to the Internet. If you have some computers available, the exchanger can link them together.

3.6 Power failure direct communication 801~ 804
If power failure happens, 801~ 804 extension can be put through to the outer line (the outer lines available link to the relative extensions), communication is not affected, and extension above 805 stop working for the time being.

3.7 Perfect Signal System
According to the system and status of extension exchanger supplies dialing sound, long and short bell’s sound, various pushing sound, error sound, busy sound, approval sound, music, long and short two sounds bell and one sound long bell, therefore the user can make a judge for the above. If sound for 1 second and pause for 4 seconds, it is standard call-in bell from the outside. The last is long and latter is short, and two sounds’ bell is external computer working mode or transferring call. If the last is short, latter long, internal call. If sound for 1 second, and pause for 1.5 second, it is group’s call or part of group’s call. If pushing sound is heard, it is call-in or transferring push, and group call’s pushing of the telephone meeting. You will gradually understand and distinguish these functions, and benefit from it.

IV. Program and Applications
Note: 1. Except opening secret code lock, all of programs are run by No.801
2. After one piece of programmable command is entered correctly sound “du” for a second as an approval sound will be heard, and then enter the next command. The quick handling method can complete all of your commands very soon. If no approval sound, it means incorrect or null command is entered if correct command is entered, it will OK.

3. The Implication of the Letters in the Commands are as follows:
   ab – two digits series no. Of extension ab =(01~10~16)
   D – one digit natural number D =(0~9)
   W - one digit natural number, on. Of eternal line jack W =1.2.3.4

4.1 Recovery of status of out of factory-total clearing function.
   Format: *#1000
   Usage: used for the exchanger for the first time, or for resetting afterwards

4.2 On-duty mode, digit record monitors on-duty extension.
4.2.0 Man-mode On-duty Mode
   Format: *#2000
   Usage: after this command is entered all of external lines are in the mode of man-made on-duty. If non-disturbing is not set the extension will ring from any outside call. This mode is suitable for the place without the fixed person on duty, such as family villa.

4.2.1 Format: *#200W
   Usage: After this command is entered, the appointed external line is in the mode of man-made on-duty, not affect calling from the outside, which has been installed a computer telephone.
   The Mode of Computer Operator On-duty

4.2.2 Format: *#2100
   Usage: After this command is entered, all of out lines are in the mode of computer on-duty. When a call is from outside, digit recording replay is generated, instructing the caller how to operate. At this moment the caller call directly dial the extension, or dial “0” to call on-duty extension. If the caller is the first one, don’t know what to do, on-duty extension is automatically put through after recording is completed for 4 seconds. At this moment whatever it is, internal line or external line of extension, pushing sound is heard. So on-duty extension will respond quickly and hang up. If calling succeed, the extension which is being called will ring. The caller will hear the music. Put up the receiver, you can speak on the telephone. This mode is suitable for company, hotel and restaurant, realizing complete communication management.

4.2.3 Format: *#210W
   Usage: After the command is entered, point out lines as mode of computer on-duty. It does not affect the other out lines, which set up working mode. For the others remain as the same.
   Example: If you only hope out lines to work for computer style, the other out lines work for man-operated style, then you first enter “*#2000”, following enter “*#2102”. It would be OK.

4.2.4 Recording
Format: *#2200
Operation: after the command is entered, you will hear the implied voice of the telephone, then you read the contents which is arranged in advance to the microphone, time should be controlled within 10 seconds. After recording you must be enter “#” to stand for end, in order for the main machine to identify. It can improve operational efficiency. Again after 10 seconds, you will hear implied voice to show successful recording. You should select the telephone with good sensitivity and good quality, so that the voice will be clearer and voice’ quality will be better. Remember not to record when free holding otherwise it will be noisy and voice is low.
Recording contents must have “please dial extension, check number, please dial zero” or “please dial the extension, on duty 8ab” etc. To tell someone how to operate (ab as on-duty’s extension number). Others contents, such as your name or company name, telephone number etc. are mastered by the users themselves. Let’s take two examples as references. Example 1: “how do you do! Baixin appliance manufacturer. Please dial the extension, on-duty 816. Fax 808, after work dial 13902222635 if urgent.” In that case, out lines is entered into the exchanger will replay the recording, assuring that your company and units connect with outsides.
Example 2: “how do you do! I am XXX, and not in right now, please call 1271171428 if you want to look for me. This case is suitable for house and villas. If someone is in the house enter man-made’s on-duty command, you will receive the call at any time. If not in, enter working mode command, and some call you, imply him your direction and connect him. After back home reenters man-made’s command.
Recording coordinate with other functions to produce countless functions and pleasures. After you gradually understand more about the exchanger, you will produce the unexpected effects. You can change recording contents many times, only enter the command again. If not change, recording contents can keep at 10 years at least.

4.2.5 monitor recording
Format: *#2300
This command can check the recording contents and effects to decide whether or not to repeat recording.

4.2.6 Monitor Music
Format: *#2400
After the command is entered, pleasant music can be heard, and can use this function to check the quality of the telephone set.

4.2.7 Building on-duty Extension
Format: *#25ab (ab’s meaning is as the above)
When the product is out of the factory or total clearing is finished, the main machine thinks 802 as on-duty machine. If this command is entered, any extension can be set as on-duty extension, such as setting 816 as on-duty extension. It will be Ok. If you enter “*#2516”, you can change the on-duty extension an our requirements. If you want to change to 808 on-duty, enter “*#2508”.

4.3 No Disturbing
The extension with “on-disturbing” function will not ring if comes a call when in the man-made or no reply call. This way will get rid of the unnecessary telephone
disturbance. Except on-duty extension any extension can be installed “no disturbing” function. It’s useless for the on-duty extension to be installed “no disturbing” function, even if all of the other extensions are installed “no disturbing” functions, still keeps on communicating with the outside whatever it is.

4.3.0 Canceling “no-disturbing” function of all of the extensions
Format: *#3000
After this command is entered, “no disturbing” functions can be canceled. When out of the factory or total clearing all of the extensions are not installed “no-disturbing” functions.

4.3.1 Install “no-disturbing” function on all of the extensions.
Format: *#3001
Except on-duty extension, this command means all of the extensions are in the mode of “no-disturbing”

4.3.2 Install “no-disturbing” on the appointed extension
Format: *#3ab1 (ab’s meaning is as the above)
This command means the appointed extension is no disturbing.

4.3.3 Canceling “no-disturbing” on the appointed extension
Format: *#3ab0 (ab’s meaning is as the above)
This command means only one extension’s “no-disturbing” is canceled.

4.4 Controlling on calling to the outside over
The extension (opens or locks the external lines)

4.4.0 Open the appointed external lines of the extensions.
Format: *#4000W (W’s meaning is as the above)
This command means canceling controlling on the appointed external lines.

4.4.1 Lock all of the appointed extension
Format: *#4001W (W’s meaning is as the above)
The command means finishing controlling on the appointed external lines.

4.4.2 Open the extension on all of the external lines
Format: *#4ab00 (ab’s meaning is as the above)
Total clearing command, then means canceling controlling on all of extensions’ external lines.

4.4.3 Lock the extension of all of the external lines
Format: *#4ab10 (ab’s meaning is as the above)
This command means locking all of the external lines on the appointed extensions, inner calling are only worked if out of the call, unlock external lines’ others extension to dial or put secret no in and dial out.

4.4.4 Open an external line on the extension
Format: *#4ab0W (ab’s meaning is as the above, W is as external line’s No.1~ 4)

4.4.5 Lock an outside line of an extension
Format: *#4ab1W
This order can lock the appointed outside line of the appointed extension. The above order can be used alone or with others, so you can control the extension to enter into the outside line. Etc, you can lock all the outside lines of a certain extension, if necessary, open one or two appointed outside line. Mean while, if you have one or
two outside line which can be connected the net, and you only allow the appointed
extension on net, then use the mentioned order to limit the other extensions.
Multi-functions used together will create an efficient, active and convenient
environment to you.

4.5 Out-coming number control

4.5.0 Pressed input

Input the data as follows:

Etc, the different data groups with the order number 1~10 can’t be inputted into the
switch board one time, then input the data 1~5 in order, with the No.1 group data in
the downside and the No.5 in the upper. If the No.6 group data wanted, then the No.1
will be lost automatically, in other words, if press a new group data, the first one will
be lost.

4.5.1 Release the out-coming number control to extensions

Format: *5ab##

This order can release all the numbers control to the appointed extensions.

4.5.2 Control out-coming number to the extensions

Format:

A: *#5abD# locks one digit numbers
B: *#5abDD lock two-digit number

You can input a group number with one or two digit data locked, which can control
the outside party number with the same data as the locked not dialed by the appointed
extension.

For example, 804 extension only offers the in-city call service.

Key the “*#5040#”, 04 is the extension order number, 0# lock 0 digit data. After that,
804 extension only offers the in-city call service.

The releasing way as follows:

This switchboard offers a capacity of ten group data with one or two digit,
furthermore, thirty group’s public out-coming number control available, which will
meet your requirements.

4.5.3 Release public out-coming number control

Format: *#5900000

This order can release the thirty group’s public out-coming number control in one
time.

4.5.4 Limit all the extensions out-coming number

Format:

A. *#591D### locks one digit data
B. *#591DD## locks two digit data
C. *#591DDD# locks three digit data
D. *#591DDDD locks four digit data

You can input a group public out-coming number control with 1~4 digit locked by
this order. The outside party number with the same data as the locked can’t be dialed
by all the extensions.

This switchboard offers thirty groups public out-coming numbers. Pressed input.
The basic operation as following:
Example 1. Not allow to dial international call by all the extensions
Key *#59100##
After that all the extensions only offer the in-country long distance call except the international call.
Example 2. Not allow to dial the 168 call for information by all the extensions.
Key *#591168#
After that you can’t dial the telephone number with 168 data, the others with “1” or “16” can be dialed.

4.6 Extension out-coming time limit controlling
4.6.0 Release all the extensions out-coming time limit
Format: *#6000
This order can release all the extensions out-coming time limit.
4.6.1 Limit all the extensions out-coming time
Format: *#600DD
This order can limit all the extensions out-coming time as the same.
4.6.2 Release extension out-coming time limit
Format: *#6ab00
This order can release the appointed extension’s time limit.
4.6.3 Limit extension out-come time
Format: *#6abDD
The mentioned orders can be used in combination. For example, if you limit the most of the extensions out-coming time in ten minutes, key “*#60010”, 801 extension no time limit, key “*#60100”, 802 extension is the extension on duty with limit of three minutes limit for working efficiency improvement, key “*#60203”. So if all the extensions with out-coming time limit exceed the connection limit, you will hear the reminding tone to urge you to finish the connection soon. Otherwise, exceeding one minute, the outside line will be cut off by the system automatically.

4.7 Allow to dial special number by the extension
Format:
A. *#7abD###   Permit one digit, effective
B. *#7abDDD##   Permit two digit, effective
C. *#7abDDD#   Permit three digit, effective
D. *#7abDDDD   Permit four digit, effective
You can input a group data with 1~ 4 digit allowed data by the appointed extension by this order. The switchboard offers two groups allowed dialing number for every extension, pressed input.
For example, the 803 extension’s long distance call locked, the public controlling locks “1” digit, you want to open the Mobil phone 13902222635 of the factory’s director’s or the manager’s and the 803 long distance call in Shanghai, key continually “*#7031390#703021#”, the “*” can be omitted. So the 803 extension only offer the long distance call in Shanghai, can dial the Mobil phone of the factory’s director or the manager’s, except the numbers with “1” digit data. The emergency number with “11” “12” still can be dialed.
Key two pieces orders of A continually, then the allowed dialing number canceled.
Password management

4.8.1 Universal password
Format: "*#89DDDDD" five digit password
To change the password, just re-key it. It is an upper password.

4.8.2 Extension password
Format: *#8abDDDD four digit password
You can set up a password for the appointed extension by this order, to change the password, just re-key it.
The mentioned operation shall be operated by the 801 extension.

4.9 Password opening and application
This action can be operated by any extension, the correct opening can re-open the outside line and release the numbers of all the extensions as well as the outside call controlling. The outside call time limit is still effective. There is no reminding to the wrong input.

4.9.1 Open universal password
Format: *#99DDDDD
Input this order on any extension, if the password is right, then the outside line can be reopened. It is the most upper password, which shall be controlled be one or two person.

4.9.2 Open extension password
Format: *#9abDDDD
ab must be the order number of the extension, DDDD is the password. Only the ab is a match for the DDDD, the outside line can be re-opened.

4.9.3 Redialing available
After opening the password and re-opening the outside line, dial the outside party’s number, if the line busy, hang off and wait, pick up and redial. So when the connection finished, you are sure to hang off and key some numbers in order to avoid the dialing by pressing redialing key.

4.9.4 Special line for special usage of the fax machine jack
Format: *#29ab
Set up the fax machine jack for special usage, if the most upper outside line in-come, start the fax machine to the appointed extension jack.
Cancel: *#2900
Interrupt mask call function
When the extension needs to operate the Bureau’s special function, which will conflict with the called extension number, so you can pick up to input the password and hear the dialing tone to operate the special function. By this means, the conflicting avoided.

V. TECHNICAL PARAMETER
5.1 Exchange Style ------------------------------------------ Analog Space-division
5.2 Terminal Condition
5.2.1 Telephone Type ------------------------------------------ Dual-tone Frequency
5.3 Talking Line ----------------------------------------------- 8-cord Channel
5.4 Signal Tone
5.4.1 Exterior Line---------------------------------------- Telecommunication Office Tone
5.4.2 Interphone Dialing Tone---------------------------------------- 450Hz, Continuum
5.4.3 Interphone Aftersound ----------------------------------- 450Hz, One sec ringing, four-sec disconnection
5.4.4 Interphone Busyness, or mistake ---------------------------------------- 450Hz, 0.35 sec ringing, 0.35 sec disconnection

5.5 Feed
5.5.1 The pressure of feed ---------------------------------------- 24V
5.5.2 The Electric current of feed ---------------------------------------- 20~30mA

5.6 Circuitry Condition
5.6.1 User Line Loop Resistance (telephone incl.)< 1 kilo-ohm
5.6.2 Relay Line Allowed Loop Resistance< 2 kilo-ohm

5.7 The characteristic of transfers
5.7.1 Extension--extension---------------------------------------- <=1.5dB
5.7.2 Extension--relay---------------------------------------- <=1.0dB
5.7.3 Distortion degree---------------------------------------- <=7%

5.8 Ringing Current---------------------------------------- AC90V +/- 15V, nothing record

5.9 Tolerate---------------------------------------- 50Hz/1000Vrms/one minute
5.10 Insulation---------------------------------------- Resistance Power-line against Shell and Group > 10 mega-ohm
5.11 Power supply---------------------------------------- AC220V +/- 10%
5.12 Power waste---------------------------------------- <= 12VA
5.13 Using condition---------------------------------------- -10 ~ 40 C the humidity <95%

VI. Troubles and Troubleshooting
With reliable and stable performance, faults rarely occur to this multiplexer channer exchange. But some of its functions will be mistook as the trouble if users set or use it improperly. Therefore, whenever any trouble occurs, please think about it first whether the exchange is set or used improperly or not, then try to find out the cause or causes by reading the Users Manual or referring to the following table. If the trouble(s) can not be solved finally, please contact the local distributor or our plant, and a satisfactory reply will be offered to you.

6.1 Symptom: not available for calling in and out, without sound.
   Cause: poor outside connection or without outside lines; power supply not connected; poor connection of extension.

6.2 Symptom: calling in and out not available for extension
   Cause: this extension is not set at the dialing mode of dual-tone frequency, or the calling-out restriction is set.

6.3 Symptom: it is interrupted after a period of call.
   Cause: the time limit is set for this extension, or the connection of line is poor.

6.4 Symptom: with noise
   Cause: with interference with the line, or poor connection, or the power voltage is under 160V, the telephone is not qualified.

6.5 Symptom: voice distortion
   Cause: the quality of telephone is poor, or the line for extension is too thin or too long.

6.6 Symptom: others
Cause: others, consulting local distributor or our plant.

Illustration for the Command Quick-Enquiry Sheet
1. Except for the last two commands, all the others operated by Extension 801.
2. Letters in commands indicate as follows:
   (1) a and b two natural numbers, serial number for extensions (01~16)
   (2) D one natural number, D=(0~9)
   (3) W one natural number, serial number for outside lines W=(1 ~ 4)
   (4) N 1-bit code containing a natural number and code “#”

<table>
<thead>
<tr>
<th>Command Quick-Inquire Sheet</th>
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<tbody>
<tr>
<td>Command Codes</td>
</tr>
<tr>
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<td>#2100</td>
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<tr>
<td>#210W</td>
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