Installation Manual
Ring-Master System RM5000

Ring-Master Communication &
Security Systems

from **Alpha Communications**

Installation manual System RM5000

.

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1. INTRODUCTION

1.1. GENERAL SYSTEM DESCRIPTION

RING MASTER SYSTEM RM5000 is an all-to-all direct speech system, controlled by a fully electronic central exchange. Similar to a minicomputer, all its functions are microprocessor controlled. Its primary purpose is to communicate with the subscribers and establish connection between them. The RM5000 system can be expanded from 2 up to a maximum of 56 subscribers, and the central unit can handle up to 4 simultaneous conversations. The exchange also enables the user to select from a wide range of programmable features designed to achieve flexibility and optimal efficiency in internal communication.

SIMPLIFIED INSTALLATION

The "central" or exchange unit - roughly the size of a briefcase - can be mounted in virtually any convenient internal location and can be equipped with back-up batteries for emergency service in the event of mains power failure.

Each station is connected with 4 wires to plug-in screw terminal blocks at the central. Using standard 0,6 mm/24 AWG telephone type twisted pairs, each station can be located up to 350 meters/1.100 ft. from the central.

All important control functions are centralized, simplifying the design of stations for optimum reliability.

Fig. 2.1. System RM5000, Layout.
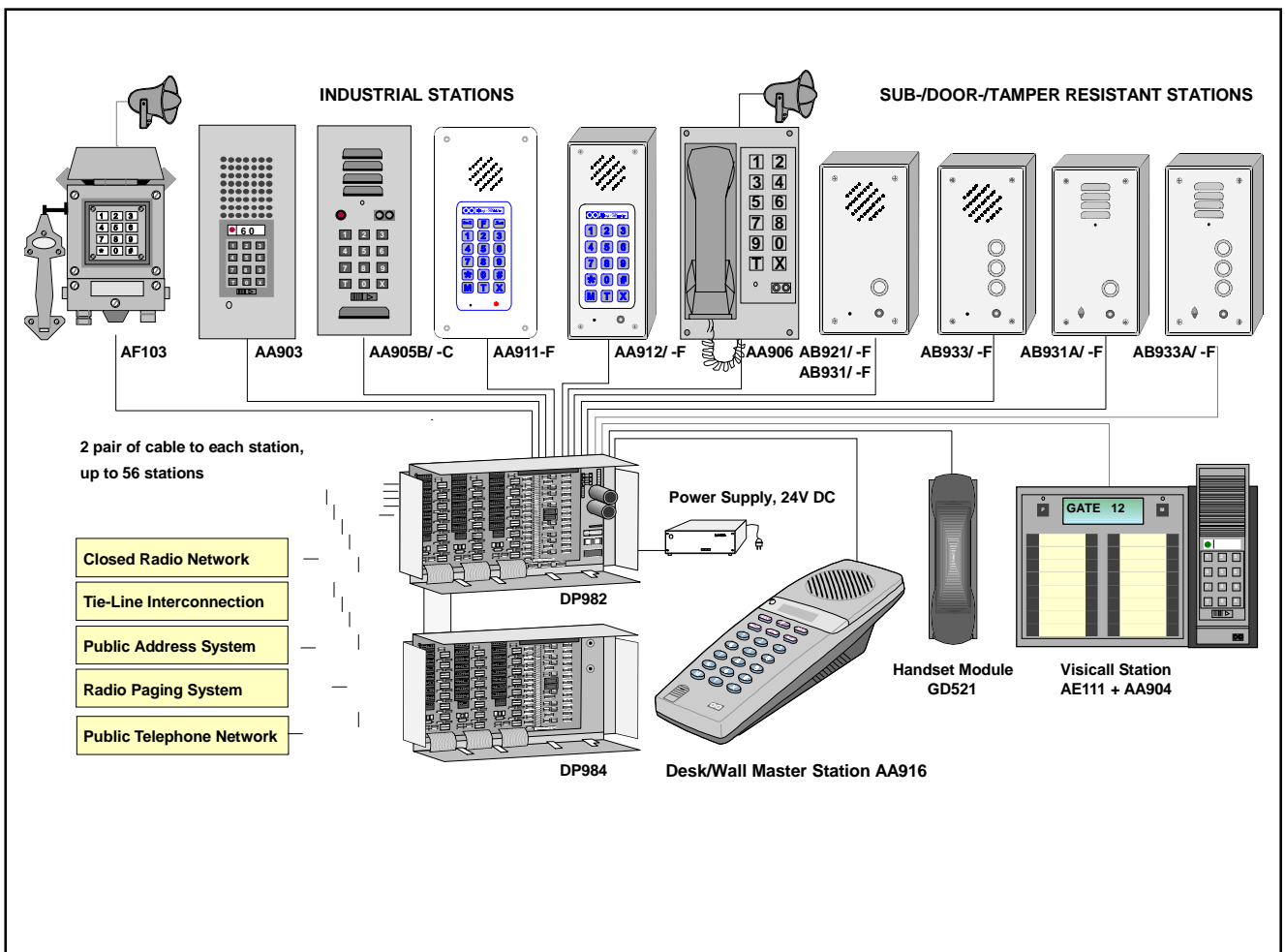
STATION CAPACITY 2 TO 56 SUBSCRIBERS

The modular construction of the central permits easy expansion, station by station, from 2 up to a capacity of 56 subscribers. Moreover, a wide range of station types increases the flexibility of the system matching the need of any user in industrial or commercial applications.

LINK CAPACITY/ TRAFFIC HANDLING.

The RM5000 system is equipped with 4 conversation channels, this means 4 conversations can take place simultaneously. Each link is equipped with one dialling register.

If, in a system of 56 subscribers, a blocking percentage of 1% is accepted, the system can handle a traffic of more than 0.015 erlang. (For comparison the SPRI requirements are 0.01 erlang).

NUMBER SERIES

The Ring-Master RM5000 is a 2 or 3 digit dialling system, with call numbers programmable from 10 - 99 or 100 - 999. The presetting of 2 or 3 digit dialling is by switch setting, (switch group U49 on Control Card NFE1643). When initialized, the system has a default number range of 10 to 65 or 100 to 155. If the call numbers need to be individually adjusted (for example to match the telephone system), the station's call number is programmed by *(Station Terminal programming):*
- the master station connected to line position 10 (entire system programming)
- the master station connected to the actual line position (individual subscriber programming).

EASY OPERATION.

You name it - and SYSTEM RM5000 can be programmed to do it meeting the most exact specifications and doing it with a maximum of 4 wires, and without "special feature" buttons to be remembered.

The station is small and neat - it is about the size of a normal telephone handset. Handsfree loudspeaking, confidential softspeaking, total privacy, camp-on busy and microphone cutout are all standard features.

A WIDE RANGE OF FEATURES

A wide range of features/functions are available in the RM5000 system. These are divided into 4 categories: *Standard features* (available to all users), *System features* (available to all users by switch-programming), *Individual features* (available to particular users by software/Station Terminal Programming), *Interface features* (integration to other communication networks by adding external devices).

SIMPLIFIED INSTALLATION/ CABLING.

The unique cabling concept provides the advantage of both centralised and decentralised cabling arrangement. Each station requires one single pair for dialling and conversation. Power is provided via a second pair to serve the station's built-in amplifiers. The power can either be individual to each station or to remote groups of stations supplied from local mains power units.
For subscriber connection to the RM5000 system special plug-in screw terminals are used.

COMPACT SIZE.

The central unit is compact, a basic cardrack (DP 982) equipped for 24 subscribers measures only 270 x 440 x 150 mm (i.e. 10.6" x 17.4" x 5.9"). A similar cardrack provides for expansion from 24 to 56 subscribers. The central unit is silent in operation and can be installed in almost any location.

1.2. CENTRAL LAYOUT (see Fig. 2.2).

1. BASIC CENTRAL CARDRACK.
  Cardrack MKE3057 is equipped with plastic front cover MKA1304. The Control Card NFE1643 consists of the microprocessor (CPU) and its controlling parts. The first 8 subscriber circuits are also located on NFE1643.

2. SUBSCRIBER TERMINAL BLOCKS TB10 - TB17.
  Each plug-in terminal block has 6 screw terminals for standard connection of a station's 4 wire cable.
    - Terminal 1 and 2 for audio and signalling
    - Terminal 3 (positive) and 4 (negative) for 24V DC power supply .

3. STATION STATUS INDICATORS.
  Vertical row of 8 LED's in 2-packs marked LED 901 - LED 908 indicates "station operating".

4. WARNING TONE REGULATOR.
  Potentiometer R7 adjusts volume of warning-tone.

5. VOICE-SWITCHING REGULATOR.
  Potentiometer R8 adjusts voice-switching sensitivity of system (duplex switching).

6. VOLTAGE INDICATORS.
  LED 1 - LED 3 indicate status of internal DC operating voltages 24V, 10V and 5V. LED 4 flashing indicates CPU in processing mode.

7. CENTRAL ON/OFF SWITCH -S1.

8. FUSES.
  Fuse F1 - 1,6A - for 24V DC, Fuse F2 - 4 A - for 24V AC, Fuse F3 - 1,6A - for 5V DC

9. TERMINAL BLOCK FOR EXTRAS, TB 2.
  Terminal 1 and 2 are connections to radio paging encoder (series transmission)..
  Terminal 3 and 4 are for Programme Distribution source (channel no. 1). (radio, tape etc).
  Note: Termination of Programme Distribution channel no. 2 is to line position 17.

10. EXTERNAL POWER TERMINAL BLOCK, TB 1.
  The block has 6 terminals:
      1/2 - Input voltage, 24V AC from transformer NTA3023.
      4/5 - Input voltage, 24V DC from battery/charger for no-break system, terminal 4 is negative and 5 positive. From LA924, for additional power when the system is equipped with more than 16 subscribers and features all call, group call or programme distribution.
      3/6 - Output voltage 24V DC, for station power connection when the system is equipped with more than 8 subscribers. Connection to Terminal Block TB 18, 1 and 2 with 1,5 mm dia.
    cable.

11. INTERNAL POWER TERMINAL BLOCK TB 18.
  Internal connection of subscriber power - used if more than 8 subscribers. Power wires from Terminal Block TB 1, terminals 3 and 6 to first subscriber card NFE1644 Terminal Block TB 18, terminals 1 and 2. Out from this Terminal Block to Terminal Block TB 18 on second subscriber card, and so on.

12. FUSE F 901.
  1,6 A fuse for first 8 numbers on Control Card NFE1643. Individual fuses are also located on each successive subscriber card NFE1644.
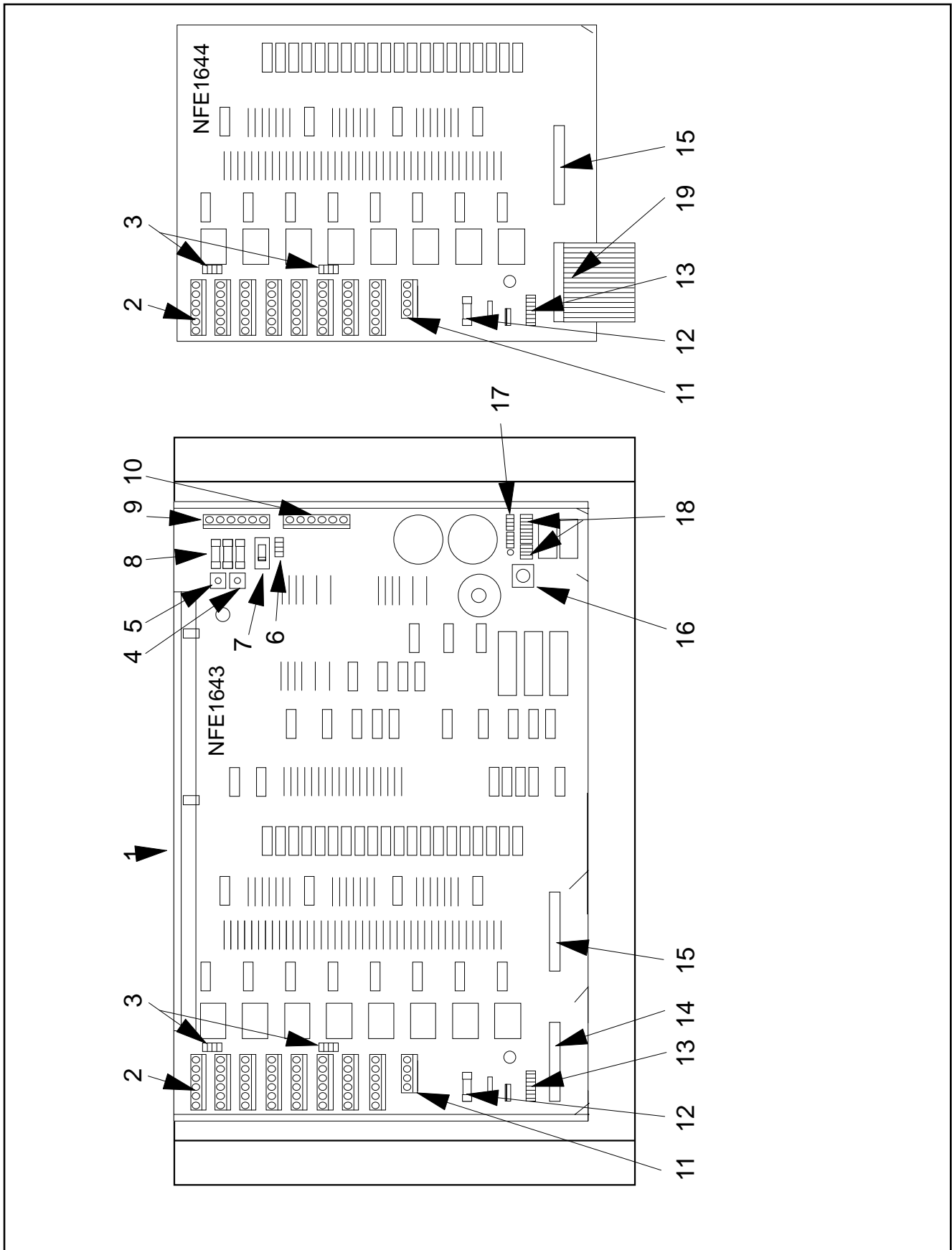
Fig. 2.2. System RM5000, Central Layout. Ring-Master

13. STRAP MATRIX FOR LINE POSITION NUMBER SEQUENCES, J1
To select line position number sequence required on each individual subscriber card. Any card can be programmed to have any 8-number sequence, eg. 10-17, 18-25, 26-33 etc.

14. CONNECTOR P1 ON CONTROL CARD NFE1643.
For flat cable extension to first subscriber card in subscriber cardrack DP984, for systems with more than 24 nos. or more than 48 nos. (Flat cable NMF6025 supplied with DP984).

15. CONNECTOR P2 ON CONTROL CARD NFE1643 AND ON SUBSCRIBER CARD NFE1644.
When adding a subscriber card NFE1644 (expanding from 8 to 16 nos.) its flat cable plugs into P2 on control card NFE1643. Adding another card to expand from 16 to 24 nos, its flat cable plugs into the preceding subscriber card, and so on.

16. RESTART SWITCH S2.
Clears the system/battery RAM and restarts the CPU cycle. The default number series is written into battery RAM (10-99, 100-999).

17. "TRUNK OPERATIVE " INDICATORS.
Each "half-link" LED indicates which channel is transmitting in relation to differential duplex speech levels.

18. PROGRAMMING SWITCHES.
Two switch packs U48 and U49 for programming of system features.

19. FLAT CABLE PLUG P1 ON SUBSCRIBER CARD NFE1644.
Adding a subscriber card, the flat cable plugs into connector P2 on the preceding subscriber card.

Fig. 2.3. DP982 + DP984, Layout.

DP982
Basic Cardrack

The Basic Cardrack DP982 consists of the systems control circuits (with CPU) and the first 8 subscribers, line positions 10 - 17. Into the cardrack, two subscriber cards DP983 can be easily mounted, giving a maximum of totally 24 line positions. For additional expansion, the Subscriber Cardrack DP984 must be connected which has room for 32 more line positions.

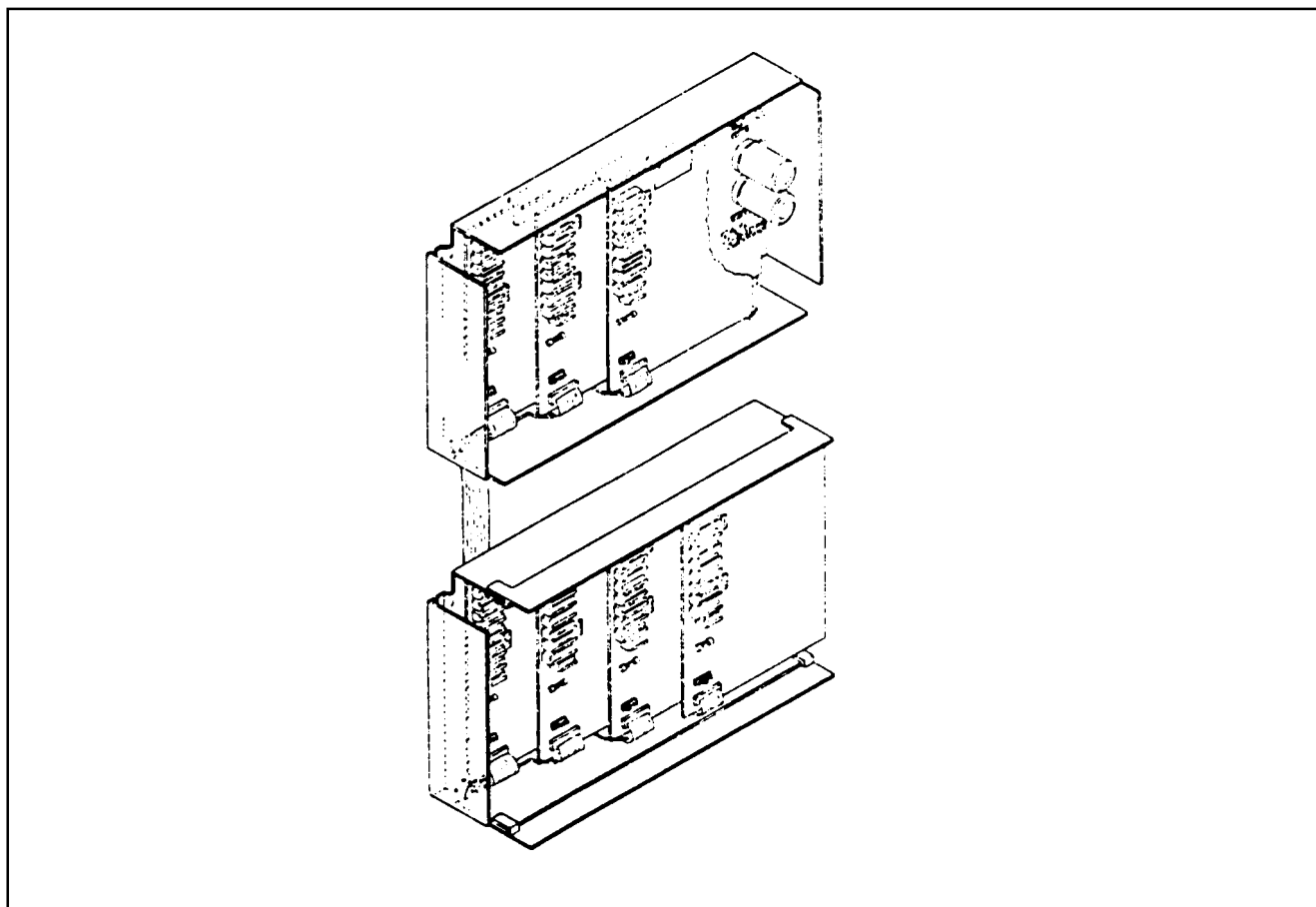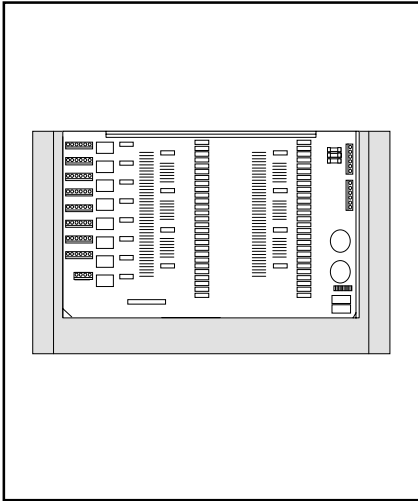The main pcb has internal voltage rectifier and regulators, and the system's power sypply is terminated via plug- in screw terminals. Two dip switches, U48 and U49 is used for feature programming.

Power supply:
without all/group call/music
              24V AC/NTA3023
with all/group call/music
              24V DC/LA924
Internal operating voltages:
              CMOS 10V, TTL 5V
Power consumption
              ca. 200W
Microprocessor:
              8 bit processor MC6802
Memory:
              PROM 32 Kbyte
              RAM 8K bytes
Operating temperature:
              0 to + 35 degrees C.
Dimensions, Basic Cardrack DP982 w/cover:
              height: 276 mm
              width: 448 mm
              depth: 85 mm
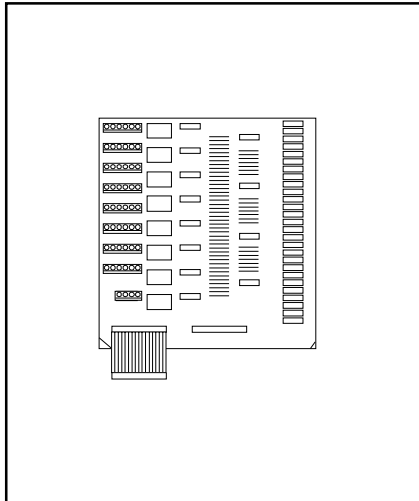
DP983
Subscriber Card

Each subscriber card DP983 contains 8 subscriber line positions. Plug in screw terminals are used for termination of the installation cable (2 pair cable). On each card there is a fuse to protect against short circuits on the installation network, only 8 subscribers will be out of operation.

2 subscriber cards DP983 can be installed in the Basic Cardrack DP982 and 4 more can be mounted in the Subscriber Cardrack DP984.

Each subscriber card has a 20 pair ribbon cable for easy plug in interconnection to the control circuits and to the common system subscriber bus and internal operating voltage

Operating temperature:
              0 til + 35 degrees C.
Power consumption:
              ca. 1 W
Internal operating voltages:
              CMOS 10V, TTL 5V
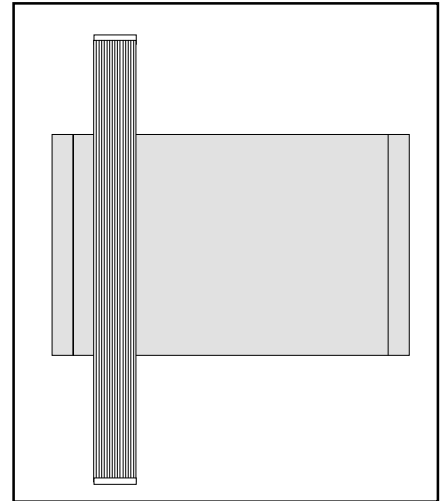
DP984
Subscriber Cardrack

The Subscriber Cardrack DP984 is required when the total system subscriber capacity is more than 24 line positions. In DP984 there is room for up to 4 Subscriber Cards DP983, each with 8 line positions.

The DP984 unit consists of the metal frame with cover and a 20 pair ribbon cable. This cable is used for interconnection between the control card in DP982 and the first subscriber card DP983 mounted in the Subscriber Cardrack. This cable MUST be used, no other installation cable will work since the cable transmits high speed data signals.

Dimensions:
              Height: 276 mm
              width: 448 mm
              depth: 85 mm
Colour: pearl grey

Ring-Master
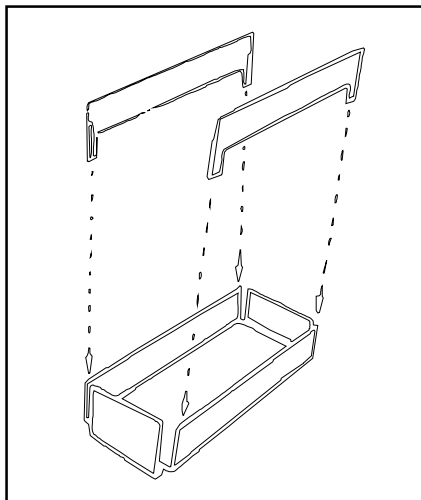
DP985
Expansion Brackets.

These two expansion brackets are required only when the system is equipped with more than 48 line positions (between 49 and 56). These increase the height of the Subscriber Cardrack DP984 to give room for the last subscriber card and on which the plastic cover is fitted.
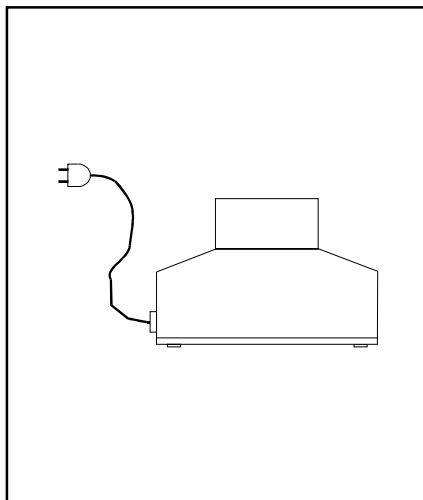
NTA3023
Transformer.

The Transformer NTA3023 can be used when the RM5000 system operates without the features:
- all call
- group call
- programme distribution (music)

When these features (one or several) are required, the Power Supply LA925 (or equivalent) must be used.

Specification:

Input voltage:	220 Volt AC
Output voltage:	24 Volt AC
Power:	100VA
Colour:	grey
Dimensions:	height: 90 mm
	width: 102 mm
	length: 150 mm
Weight:	3.7 kg
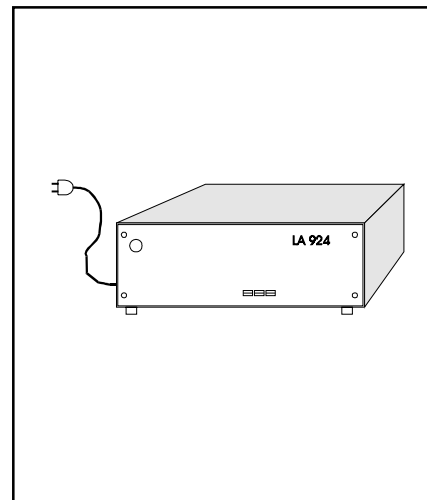
LA925
Power Supply

The Power Supply LA925 must be used when the RM500 system operates with one or several of the features:
- all call
- group call
- programme distribution (music)

When a system with these features is equipped with more than 32 subscribers, 2 power units LA925 must be used. They can be connected in parallel.

Note: Transformer NTA3023 can not be used together with the Power Supply LA925 on the same installation.

The LA925 is a switch mode power unit, and the output voltage can be adjusted between 20 and 30 volt DC. It is short circuit proof, has thermal protection and protection against over- and under output voltage.

If required, two or more units can be connected in parallel (larger installations). Delivered from RingCom AS, the output voltage is adjusted to 27.2 V, which is correct voltage for battery charging.

Input voltage:	198 - 250 Volt AC
Output voltage:	20 - 30 Volt DC adjustable.
Power consumption:	130 Watt
Maximum load/current:	5 Amp. max
Ripple/noise	<10 mV p-p 66kHz
	<2 mV p-p 100 Hz
Dimensions:	192 x 109 x 53,5mm
Weight:	850 gr.

Ring-Master
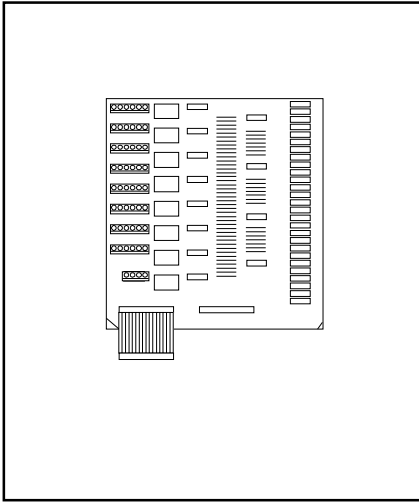
NFE1681A
Voice messaging

The Speech Storage Card NFE1681A gives the possibility to send spoken messages to the calling person when the receiver is absent. The spoken message is prerecorded, and can be changed at any time to meet local requirements for contents and language. The user can then select the message required from any intercom station. However, individual messages can not be recorded.

The speech storage card replaces one subscriber card in the central. The maximum number of subscribers in the system is then reduced by 8. The card has speech storage of max. 24 seconds, which can be divided as follows:

  - 1 message of 24 seconds
  - 4 messages of 6 seconds
  - 6 messages of 4 seconds
  - 8 messages of 3 seconds

These combinations are switch selectable.

The card is the same size as a standard subscriber card DP983.

A subscriber, when leaving the station, uses the feature Call Forward, to transfer his own call number to the line position where the required voice message is stored.
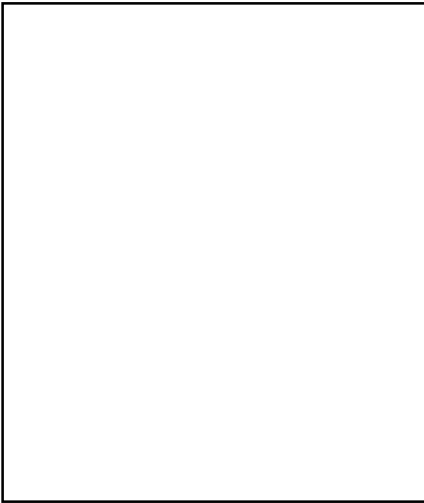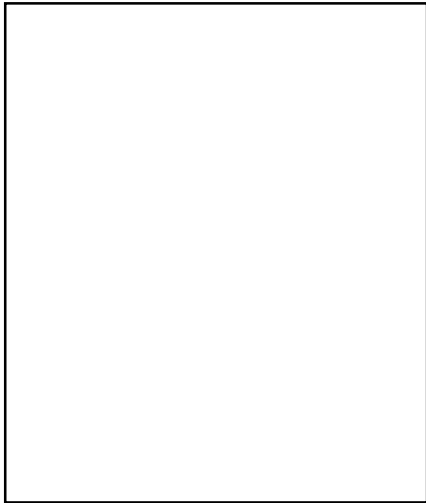
2. STATIONS

The stations are basically divided into two categories; Master Stations and Sub Stations.

Master Stations - able to make calls or to receive calls from any other call number.

Sub Stations - for receiving calls only, from any master station. Some substations have keypad with limited call access (station with auto-dialling and stations with direct access feature).

MODELS

A variety of models are available. These include the master stations AA916 and AA904, (they are all one-piece units designed for desk or wall-mounting). Several industrial master stations are available: AA903,/AA905,/AA906/ AA911 and AA912, substations AB911/ AB912/ AB921,/AB923, ex-proof station AF903, vandal proof stations AB931/AB933, door stations AB931A/AB933A and remote microphone and loudspeaker units.

OPERATING THE STATION

Each master station is equipped with a standard 12-button keyboard. No extra feature buttons are required, a simple push-button dialling process places all the features at the user's finger tips.

Making a call, the user presses the button corresponding to the first digit of the desired call number. Dial access is virtually instantaneous since all station positions are scanned continuously. On receiving a steady dialling tone, the user continues dialling.

Call connection is indicated in both the initiating and the receiving station by a warning tone and a station lamp which remains lit until the call is cancelled by either party pressing X. Should the link be busy, the caller receives an intermittent tone. A continuous warbling tone indicates, that a station is placed in privacy, wishing to remain undisturbed.

Excellent sound reproduction.

Multi-colour LED for indications. Red during conversation.

Cover with call number index.

Keys for Privacy function (both together)

Function key, F

Key to activate confidential mode.

Volume control keys, volume up/down

Standard international telephone keypad

T-to-talk" optional manual control of calls.

Microphone mut key

"X-to-cancel" key.

Sensitive microphone.

The following station models are available, please see the *GUIDE TO RING-MASTER SYSTEM RM5000* or *TECHNICAL MANUAL, OPTIONAL EQUIPMENT* for more details:

AA903	Flush-mounted Master Station
AA905B	Light Industrial Master Station, Surface
AA905C	Light Industrial Master Station, Flush
AA906	Heavy-Duty Industrial Master Station
AA911-F	Master Station w/polyester film front, Flush
AA912	Light Industrial Master Station, Surface
AA912-F	Light Industrial Master Station, Flush
AA916	Desk/Wall Master Station without display
AB931	Vandal-proof station w/1 call button, Surface
AB931-F	Vandal-proof station w/1 call button, Flush
AB933	Vandal-proof station w/3 call button, Surface
AB933-F	Vandal-proof station w/3 call button, Flush
AB931A	Door station w/1 call button, Surface
AB931A-F	Door proof station w/1 call button, Flush
AB933A	Door station w/3 call button, Surface
AB933A-F	Door station w/3 call button, Flush
AE111	VISICALL, Direct Dialling Unit
AF103	Explosion-proof Master Station

3. INSTALLATION

3.1. INSTALLATION PLANNING

Proper planning minimizes the time required and costs incurred during an installation. In the long term, maintenance, changes and expansion can be accomplished more efficiently when planned for prior to the initial installation. This results in customer satisfaction and goodwill through a minimum disruption of their business activities. Ultimately, customer satisfaction results in additional sales.

Each customer's facility is different, and requires a tailored approach to ensure that the job runs smoothly. Each facility will have its own combination of circumstances which must be addressed. The table below summarizes the major stages of a typical intercom installation. The sequence in which the stages are accomplished, or the work accomplished in each stage itself, can be modified to reflect the particular circumstances of each installation. However, the general approach should include the installation stages listed below:

STEP   INSTALLATION

1.   Site survey and data collection.
2   Plan major equipment layout. (Central, system power supply, and
        position of the various stations, speakers, etc.)
3.   Plan cable routing.
4.   Preparation and preassembly of central and power supply at shop
        facility.
5.   Site work:
            a. Running of station cables
            b. Equipment mounting (central, power supply, etc.)
            c. Station and speaker installation
            d. System programming and adjustment
6.   System check-out and commissioning
7.   Customer introduction and training.

3.2. CENTRAL LOCATION

A summary of the environmental factors affecting the Ring-Master RM5000 system is presented in the listing below. These factors must be considered when developing a detailed system plan.

Site preparation is dependent upon the customer's facilities. In many cases, there may be only one location where the central and power supply (or transformer) can be mounted. However, when several locations are possible, the advantages and disadvantages of each location should be considered. Consider each of the following factors:

Non-structural
considerations:

A. The central and power supply must be wall mounted.

B. Location of the majority of stations. Locate the central strategically, so that you can minimize the length of cable runs.

C. Location of existing telephone ducts or conduit.

D. The AC line should be dedicated exclusively to the system. If the line is equipped with a circuit breaker at the service entrance panel, the circuit breaker switch should be labelled "DO NOT TURN OFF".

E. The equipment should be installed in an area that has adequate ventilation. A temperature range of 0°C (32°F) to 35°C (95°F) and relative humidity range of 30% to 90% must be maintained.

F. Appropriate lighting conditions and adequate working space should be provided for future service calls.

G. Consideration must be given to those conditions that may cause damage to the equipment. For example, dust or vapour from flammable or corrosive solvent may cause damage. The installation site should not be located in an area likely to be flooded or likely to be damaged by moving objects nearby.

H. The central should NOT be installed in an area near electrical noise including equipment, i.e., heavy motors, welders, dimmers, radio transmitters etc.

I. The power supply (or transformer) must be mounted ABOVE the central. This is to prevent overheating the central.

3.3. CABLING REQUIREMENTS

Each station requires one single pair for dialling and audio. Power is provided via a second pair to serve station built-in amplifiers. The power can either be individual to each station or, remote groups of stations can be supplied from local mains power units, without connection to central power units.

3.4. SUBSCRIBER CALL NUMBERS

The RM5000 system has a fully flexible call number plan. The system can operate with 2 digits (10-99) or 3 digits (100-999) number plan. Selection of 2 or 3 digits dialling is done with switch no. 5 on switch group U49.

The default numbering plan is from 10 to 65 or 100 to 155 when the system is switched on without any programming. Station Terminal Programming is used to reprogram the number plan in a system, using a standard master station for the programming sequence. Any line position (always named 10-65) can be assigned any call number. Programming can be done two ways:
  - from a master station in line position no. 10. All features on all stations can be programmed from this position. This line position is normally reserved for the test position in the central room.
  - from a master station in any line position. All features related to this specific line position can be programmed.

All the feature codes are fixed, and can only be changed in EPROM.

3.5. POWER REQUIREMENTS

The RM5000 can be powered in two ways:

1. From transformer - AC input.
A transformer, primary 220 VAC (or 110 VAC) and secondary 24V/100VA is needed. Use Ring Master type NTA3023 (NTA3024/110V) or equivalent. Connect output from transformer to Terminal Block TB1 on Central Card NFE1643 - screw terminal nos. 1 and 2. This size of transformer is sufficient for supply of all central subscriber capacities - up to a fully equipped central with two cardracks and 56 subscribers, provided group/all-call and/or music distribution are not utilised.

2. From rectifier/charger - DC input.
The central can also be supplied with 24V DC only - from LA924 (LA924A/110V) or equivalent or back-up battery and charger if no-break system (for emergency) is required. Use Ring Master type LA924 (24V/4A) or equivalent, with or without 6 Ah capacity battery.

Connect to Terminal Block TB1 on Control Card NFE 1643 - screw terminals nos. 4 (negative) and 5 (positive).

One LA924 (or equivalent) is sufficient for all central subscriber capacities - up to a fully equipped central with two cardracks and 56 subscribers. However, one extra LA924 (or equivalent) is needed in parallel for systems with more than 24 subscribers when programmed with facilities all call, group call and/or programme distribution.

A system of 24 subscribers consists of one Basic Cardrack DP982 with one Control Card NFE1643 and two Subscriber Cards NFE1644.

3.6. INSTALLATION OF THE CENTRAL EXCHANGE CABINET

Check for signs of physical damage when unpacking the central exchange cabinet. See that the terminal pins on the control card and subscriber card(s) (systems exceeding 8 stations), have not been destroyed in transit. The subscriber cards(s) should be installed before wall mounting the central exchange cabinet.

Removal of central exchange and extension cardrack front panel

It will be necessary to remove the front panel to wall mount the central exchange cabinet, to gain access to the control card and terminal blocks, and to install the subscriber card(s).

As with the central exchange cabinet, it is necessary to remove the front panel to wall mount the extension cardrack, install the subscriber cards(s), and to gain access to the terminal blocks.

Installation of subscriber card(s):

The subscriber card, model DP983, is used for expansion of the system in increments of 8 stations.

To install the subscriber card(s), proceed as follows:

a. Make certain that the central exchange cabinet power switch is OFF and AC cord unplugged.
b. Plug the 40-pin flat cable connector P1 (mounted on the first subscriber card) to Socket P2 of the control card.

c. Position the first subscriber card with components side up and insert the side of the card opposite the mounting bracket into the two lower slots of the central exchange cabinet.

d. Line up the card's bracket mounting hole with the hole on the side of the central exchange cabinet and fasten with screw supplied.

e. To connect the second subscriber card, plug the 40-pin flat cable connector P1 to P2 of the first subscriber card.

f. Position the second subscriber card with components side up and insert the side of the card opposite the mounting bracket into the two upper slots of the central exchange cabinet.

g. Line up the card's bracket mounting hole with the hole on the side of the central exchange cabinet and fasten with screw supplied..

NOTE: In systems with more than 24 subscribers an additional extension Cardrack, model DP984, is needed. The following steps will allow you to connect the subscriber card(s) and cardrack.

h. To connect the third subscriber card, use the flat cable supplied with the extension cardrack DP984. Plug the flat cable plug P1 of the third subscriber card into the keyed socket of the extension flat cable. Run the flat cable out through the slot in the rack, then run under the rack and through the slot in the upper cardrack DP982 and connect to plug P1 on the control card.

i. Position the third subscriber card with components side up and insert the side of the board opposite the mounting bracket into the two lower slots of the extension cardrack.

Fig. 2.4. Extension plate DP985

j. Line up the card's bracket mounting hole with the hole on the side of the extension cardrack and fasten with screw supplied.

k. To connect the fourth subscriber card, plug the 40-pin flat cable connector P1 to P2 of the third subscriber card.

l. Position the fourth subscriber card with components side up and insert the side of the card opposite the mounting bracket into the two middle slots of the extension cardrack.

m. Line up the card's bracket mounting hole with the hole on the side of the extension cardrack and fasten with screw supplied.

n. To connect the fifth subscriber card, plug the 40-pins flat cable connector P1 to P2 of the fourth subscriber card.

o. Position the fifth subscriber card with components side up and insert the side of the card opposite the mounting bracket into the two upper slots of the extension cardrack.

p. Line up the card's bracket mounting hole with the hole on the side of the extension cardrack and fasten with screw supplied.

NOTE: In systems with more than 48 subscribers, model DP 985 Extension Plate, is needed. (See Figure B.4.) The following steps will allow you to connect the sixth subscriber card using the extension plates.

q. Clip the two extension plates on to the extension rack.

r. To connect the sixth subscriber card, plug the 40-pin flat cable connector P1 to P2 of the fifth subscriber card.

s. Position the sixth subscriber card with components side up and insert the side of the card opposite the mounting bracket into the two upper slots of the extension cardrack.
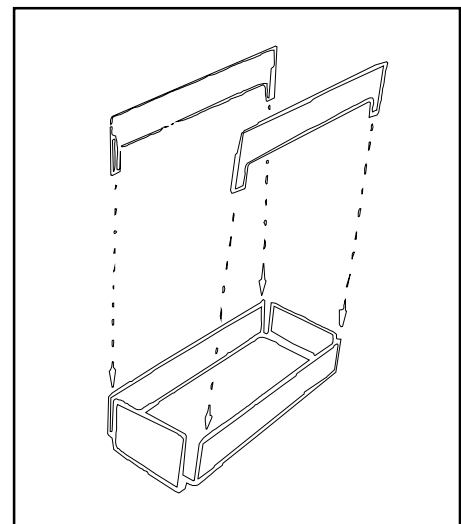
t. Line up the card's bracket mounting hole with the hole on the side of the extension cardrack and fasten with screw supplied.

Central exchange cabinet wall mounting procedure:

Position the central exchange cabinet to allow adequate spacing for the extension cardrack and the power supply. Position the central exchange cabinet to allow easy access to the side panels for cabling entry.

a. Drill guide holes in wall corresponding to cabinet holes.
b. Mount the cabinet using four screws.

NOTE: The four wall mounting screws required are not supplied with the central exchange cabinet. Be certain that the screws used can support the central exchange cabinet.

Extension cardrack wall mounting procedure:

Position the extension cardrack below the central exchange cabinet to allow easy connection between the cabinet and the cardrack. Also the extension cardrack should be positioned to allow easy access to the side panels for cabling entry.

a. Drill guide holes in wall corresponding to cabinet holes.
b. Mount the cardrack using four screws.

NOTE: The four wall mounting screws required are not supplied with the extension cardrack. Be certain that the screws used can support the extension rack.

3.7. POWER SUPPLY TERMINATION/CABLING.

The following terminals are used for power termination:
Terminal Block TB1 on Control Card NFE1643.
Terminal nos. 1-2. Input 24V AC from transformer NTA3023 (NTA3024/110V)).

24 VDC from LA924 (LA924A/110V) and/or battery connect to:
Terminal no. 4, negative
Terminal no. 5, positive

No all-call, group-call or programme distribution, Figure 2.5.
1: Station Power interconnection cabling between Control Card NFE1643 and two
   Subscriber Cards NFE1644, TB18.
2: Transformer NTA3023, 24V/4A, or equivalent, TB1

No all-call, group-call or programme distribution, Figure 2.6.
1: Station Power interconnection cabling between Control Card NFE 1643 and 6
   Subscriber Cards NFE1644. (A central expanded to max. capacity 56 subscribers),
   TB18.
2: Transformer NTA3023, 24V/4A, or equivalent, TB1.

With all-call, group-call or programme distribution, Figure 2.7.
1: Station Power interconnection cabling between Control Card NFE1643 and two
   Subscriber Card NFE1644, TB18.
2: Power Supply LA924, 24V/4A, or equivalent, TB1.

With all-call, group-call or programme distribution, Figure 2.8.
1: Station Power interconnection cabling between Control Card NFE1643 and 6
   Subscriber Cards NFE1644 (a maximum expanded central, 56 subscribers),
   TB 18.
2: Power Supply 2 X LA924, 24V/8A, or equivalent, TB1. For emergency power
   system (no-break system), use battery and charger. Capacity depending on
   requirement.

Remote power supply to stations: A station or a group of stations can be connected to remote power units. If the
central is programmed with all-call, all stations can be switched on simultaneously
and an LA 924 can supply max. 28 stations. Power consumption per station is
approx.: 150 mA at 27 VDC.
   No reference lead between remote power supply and the central unit is necessary.

3.8. CABLE DISTANCE - CABLE DIMENSIONS

To each station 2 pairs are required.
Leads nos. 1 and 2. (Master Station w/display AA960: Leads no. 4 and 5)
   These leads carry audio and signalling frequencies. They must be a twisted pair,
and shall be connected to Subscriber Terminal Block, TB10 - TB17 on Control Card
NFE1643 (first 8 subscribers) or Subscriber Card NFE1644, - terminals nos. 1 and 2.
   Maximum loop-resistance of this pair is 240 ohm corresponding to approx. 2 km
cable-length from station to central, using normal telephone cabling with 0.6 mm
diam. wiring. If the actual distance is more than 2 km. doubling this audio pair (or
using heavier cable) might not allow sufficient DTMF dialling, since the capacitance
in the cable also is increased.
   If cable to a station passes close to radio aerials or other interference sources, the
leads to the actual stations should be screened.

CE NOTES: *The cabinet must be grounded. All the attached cables must have a ferrite clipped on. The ferrites must be installed close to the cabinet.*

Wires goes straight through ferrite clamp (0,5 turn)

Wires goes through ferrite clamp 2 times (1,5 turn)

Fig. 2.5.

System up to 24 subscribers, without all-call/groupcall and progr.distribution. CE configuration.

CE: Ferrites on subscriber audio and power wires, one per card.

BASIC CARDRACK DP982

CE: Ground strap

CE: Ferrite on Paging and Prog.distribution wires

Transformer NTA3023 24V AV

CE: Ferrite on power wires

CE: If this ferrit is necessary, it is supplied with the power unit.

Fig. 2.6.

System above 24 subscribers, without all-call/groupcall and progr.distribution. CE configuration.

CE: Ferrites on subscriber audio and power wires, one per card.

BASIC CARDRACK DP982

CE: Ground strap

CE: Ferrite on Paging and Prog.distribution wires

Transformer NTA3023 24V AV

CE: Ferrite on power wires

CE: If this ferrit is necessary, it is supplied with the power unit.

CE: Flat cable ferrit, mounted inside central cabinet

CE: Strap between cabinets

CE: Ferrites on subscriber audio and power wires, one per card.

EXPANSION CARDRACK DP984

CE NOTES: *The cabinet must be grounded. All the attached cables must have a ferrite clipped on.*
The ferrites must be installed close to the cabinet.

Wires goes straight through ferrite clamp (0,5 turn)

Wires goes through ferrite clamp 2 times (1,5 turn)

Fig. 2.7.

System up to 24 subscribers,
with all-call/groupcall and
progr.distribution.
CE configuration.

CE: Ferrites on subscriber audio
and power wires, one per card.

BASIC CARDRACK DP982

10	18	26
11	19	27
12	20	28
13	21	29
14	22	30
15	23	31
16	24	32
17	25	33

TB18   TB18   TB18

TB2

TB1

CE: Ground strap

CE: Ferrite on Paging and
Prog.distribution wires

Rectifier
LA925
24V DV

CE: Ferrite on
power wires

CE: If this ferrit is necessary,
it is supplied with the power unit.

Fig. 2.8.

System above 24 subscribers,
with all-call/groupcall and
progr.distribution.
CE configuration.

CE: Ferrites on subscriber audio
and power wires, one per card.

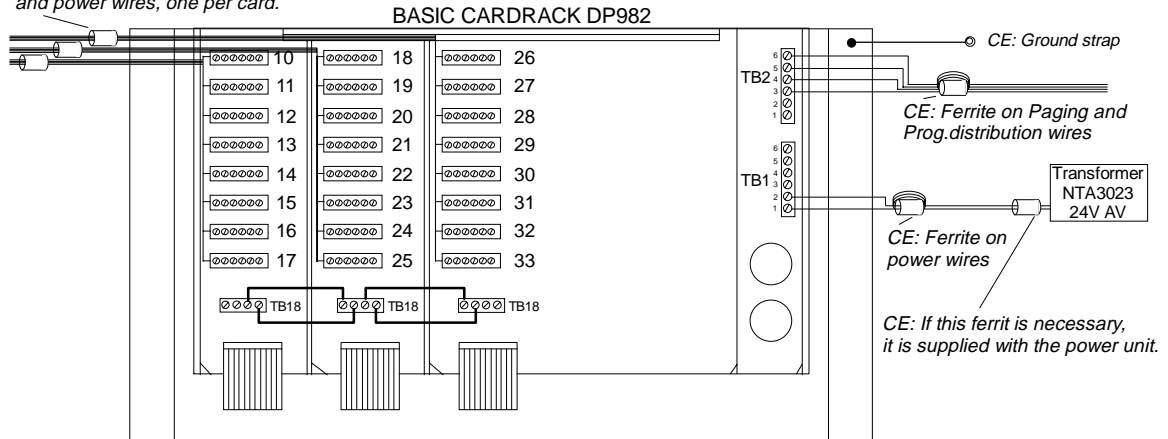BASIC CARDRACK DP982

10	18	26
11	19	27
12	20	28
13	21	29
14	22	30
15	23	31
16	24	32
17	25	33

TB18   TB18   TB18

TB2

TB1

CE: Ground strap

CE: Ferrite on Paging and
Prog.distribution wires

Rectifier
LA925
24V DV

CE: Ferrite on
power wires

CE: If this ferrit is necessary,
it is supplied with the power unit.

CE: Flat cable
ferrit, mounted
inside central
cabinet

CE: Strap between cabinets

CE: Ferrites on subscriber
audio and power wires,
one per card.

EXPANSION CARDRACK DP984

34	42	50	58
35	43	51	59
36	44	52	60
37	45	53	61
38	46	54	62
39	47	55	63
40	48	56	64
41	49	57	65

TB18   TB18   TB18   TB18

CE: If this ferrit is necessary,
it is supplied with the power unit.

Rectifier
LA925
24V DV

CE: Ferrite on power wires

Leads nos. 3 and 4. (Master Station w/display AA960: Leads 3 and 6)
These leads carry operating voltage to the stations. The maximum/ minimum station voltage for proper function is 28,5 to 21V. Power to stations can either be supplied from the central, or from a remote local power supply.

Maximum loop resistance between station and power supply (centralized or local) is 40 ohm, giving following distances from a central or local power source set at 27 VDC.

> 900 meter using 1.0 sq.mm copper wire
> 600 meter using 0.8 mm diam. copper wire
> 350 meter using 0.6 mm diam. copper wire
> 250 meter using 0.5 mm diam. copper wire

If the actual distance is more than these advised figures, doubling the power pairs or mounting local power units will be necessary.

3.9. WIRING POWER TO THE SUBSCRIBER CARDS(S)

Terminal Block TB18 on the control board and subscriber board(s) is used to carry power from control board to subscriber boards. Proceed as follows:

a. Using 1 mm diam. (WT2HD) wire connect one end of the RED lead to 24V OUT and one end of the BLACK lead to OV OUT on TB18 of the control card.
b. Now connect the other end of the RED lead to 24V IN and the other end of the BLACK lead to OV IN on TB18 of the first subscriber card.
c. Using 1 mm dia. type wire connect one end of the RED lead   to 24V OUT and one end of the BLACK lead to OV OUT on TB18 of the first subscriber card.
d. Now connect the other end of the RED lead to 24V IN and the other end of the BLACK lead to OV IN on TB18 of the second subscriber card.
e. Repeat step c - d again to connect the other subscriber cards if the system has more than 24 subscribers.

See details in figure B.2 - B.5.

3.10. STATION CABLE CONNECTIONS AT CENTRAL EXCHANGE CABINET.

Individual station terminals blocks are located on the control card and subscriber card(s). Refer to figure for connection details. Each station cable is connected to a 6-pin screw terminal block as follows:

a. The first pair of leads carry the audio and signalling frequencies and connects to the screw terminals marked SIGNAL on the control card and subscriber card(s) (maximum loop resistance of 240 ohms).
b. The second pair of leads carry the operational voltage to the stations and connects to screw terminals marked + and - (24V and OV) on the control card and subscriber card(s). The maximum/minimum station voltage for proper function is 28.5V - 21V.

Power to the stations can either be supplied from the central exchange cabinet or from a remote power supply, see fig. B.9.

The maximum loop resistance between station and power supply (centralized or local) is 40 ohms.

NOTE: If the loop resistance exceeds 40 ohms you will have to double the power leads or connect a local power supply.

3.11. CONNECTION OF PROGRAMME DISTRIBUTION (MUSIC) SOURCES.

The RM5000 is provided with two programme distribution channels and all subscribers have access to these channels by dialling the codes 061 and 062.

The programme distribution sources (radio, tape, etc.) are connected:
Channel 1 (061) to screw terminal block TB2, terminal 3 & 4, marked PROG DIST.
Channel 2 (062) to screw terminal block TB17, terminal 1 & 2, last line position on

NFE1643, (as default). The termination location of channel no. 2 can be programmed to any line position by the programming code "043". To remove programme distribution channel no. 2 the line position 00 should be programmed. (See programming chapter).

NOTE: When the RM5000 system is programmed for two programme distribution channels, the RM5000's subscriber capacity is reduced to max. 55 subscribers.

3.12. CONNECTION OF POCKET PAGING SYSTEMS

Coding signals originated at Ring-Master stations are transmitted to the pocket paging system in series form.

At the central exchange cabinet, the pocket paging system encoder is connected to TB2, screw terminals 5 and 6 on the control board. ,

NOTE: Most pocket paging systems are designed to respond to series pulse code signals per conventional telephone systems.

The code signals for the pocket page receivers must correspond to the actual station call numbers. No flexible programming code signals are possible. The pocket paging receiver codes must be reprogrammed to correspond to RM5000 numbers if it is connected to an existing pocket paging system encoder.

3.13. REMOTE POWER SUPPLY TO STATION(S)

A station or a group of stations can be connected to remote power supply units. All stations can be switched on simultaneously if the central is programmed with all-call. Battery back-up can supply a maximum of 56 stations. Power consumption per station is approximately 150 mA.

No reference lead is necessary between the remote power supply and the central power supply.

3.14. ADJUSTMENT

Duplex switching sensitivity.

For the average system, it is normally not necessary to adjust the switching circuit,- it is preset from the factory. However, different back-ground noise levels can affect handsfree speech switching.

Apart from calls to excessively noisy areas where T-button (manual switching) always should be used, the following procedure is recommended for adjustment of a system's switching sensitivity. That is, the speech level at which voice switching is desired.

Plug a station into the extra test socket you have installed in the central room. Dial a station located in a room with average back-ground noise. It must be quiet in the central room. The LED for the actual trunk in use will flicker. (LED 6-LED 13) These LEDs indicate the speech direction in a conversation. (Microphone on or off in A and B subscriber). Adjust pot.meter R8 until only louder noise peaks are heard, average back-ground noise shall not switch the speech direction. As soon as you start talking you will switch the speech direction, the corresponding LED will be lit.

LED 6 and 7 for each channel trunks in link 1
LED 8 and 9 for each channel trunks in link 2
LED 10 and 11 for each channel trunks in link 3
LED 12 and 13 for each channel trunks in link 4

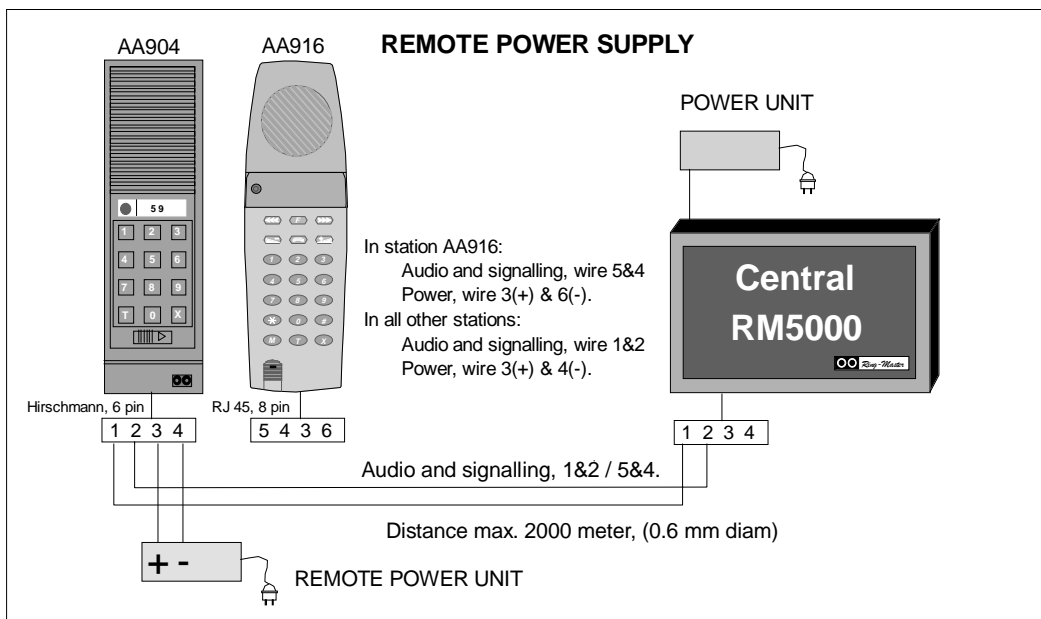**NOTE:** To return to the most sensitive switching level, use the following procedure.
a. Call two stations (three party conference) in quiet areas.
b. Turn R8 until LEDs 6 to 11 stop flickering and remain off.

Volume setting of station warning tones.

By adjusting pot.meter R7, the volume of the different tones sent to the station can be preset - dialling tone, warning tone, busy tone, privacy tone etc.

CENTRALIZED POWER SUPPLY

AA904   AA916

POWER UNIT

Central RM5000

In station AA916:
    Audio and signalling, wire 5&4
    Power, wire 3(+) & 6(-).
In all other stations:
    Audio and signalling, wire 1&2
    Power, wire 3(+) & 4(-).

Hirschmann, 6 pin   RJ 45, 8 pin
1 2 3 4   5 4 3 6   1 2 3 4

Distance max. 350 meter (0.6 mm diam.)

REMOTE POWER SUPPLY

AA904   AA916

POWER UNIT

Central RM5000

In station AA916:
    Audio and signalling, wire 5&4
    Power, wire 3(+) & 6(-).
In all other stations:
    Audio and signalling, wire 1&2
    Power, wire 3(+) & 4(-).

Hirschmann, 6 pin   RJ 45, 8 pin
1 2 3 4   5 4 3 6   1 2 3 4

Audio and signalling, 1&2 / 5&4.

Distance max. 2000 meter, (0.6 mm diam)

+ -   REMOTE POWER UNIT

Termination to installation cable:
Stations using 6 pin Hirschmann plug:
AA904, AB911, AB917, AB918
and AB919.

Pin3   Pin5
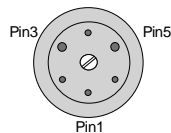
Pin1

Pin 1:   wire 1, audio & signalling
Pin 2:   wire 2, audio & signalling
Pin 3:   wire 3, power 24VDC, (+)
Pin 4:   wire 4, power 24VDC, (-)
Pin 5:   external loudspeaker
Pin 6:   external loudspeaker

Termination to installation cable:
Stations using 8 pin modular RJ45 plug:
AA916

PIN 8   PIN 1

MODULAR JACK ASSEMBLY RJ45
FRONT VIEW
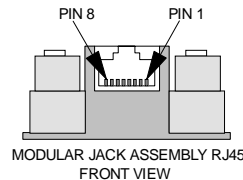
Pin 1:   external loudspeaker
Pin 2:   external loudspeaker, remote output
Pin 3:   wire 3, power 24VDC (+), remote input
Pin 4:   wire 2, (B), audio & signalling
Pin 5:   wire 1, (A), audio & signalling
Pin 6:   wire 4, power 24VDC, (-)
Pin 7:   remote output
Pin 8:   remote input

FIGURE 2.9. POWER LAYOUT

TERMINAL BLOCK CONNECTIONS:

TB1

1 2 3 4 5 6

+ 24V DC INPUT
–

24V AC INPUT

TB10-TB17

1 2 3 4 5 6

5/6 NOT IN USE

– 24 V DC   POWER
+   INPUT

AUDIO/SIGNALLING

TB2

1 2 3 4 5 6

– PAGING ENCODER
+

FROM PROGRAMME
CHANNEL NO. 1

TB18

1 2 3 4

– 24V DC OUTPUT
+

– 24V DC INPUT
+

FIGURE 2.10. CABLE TERMINATION

4. Programming

The RM5000 features are divided into 4 categories:
- *STANDARD FEATURES* - available to all users (no programming)
- *SYSTEM FEATURES* - switch programmable features
- *INDIVIDUAL FEATURES* - station programmable features
- *INTERFACE FEATURES* - integration to other communication networks

The feature programming is divided into 2 parts:

Switchprogramming:

The System Features are enabled by switch setting and are available to all users. The switch groups used are U48 and U49 on the Control Card NFE1643.
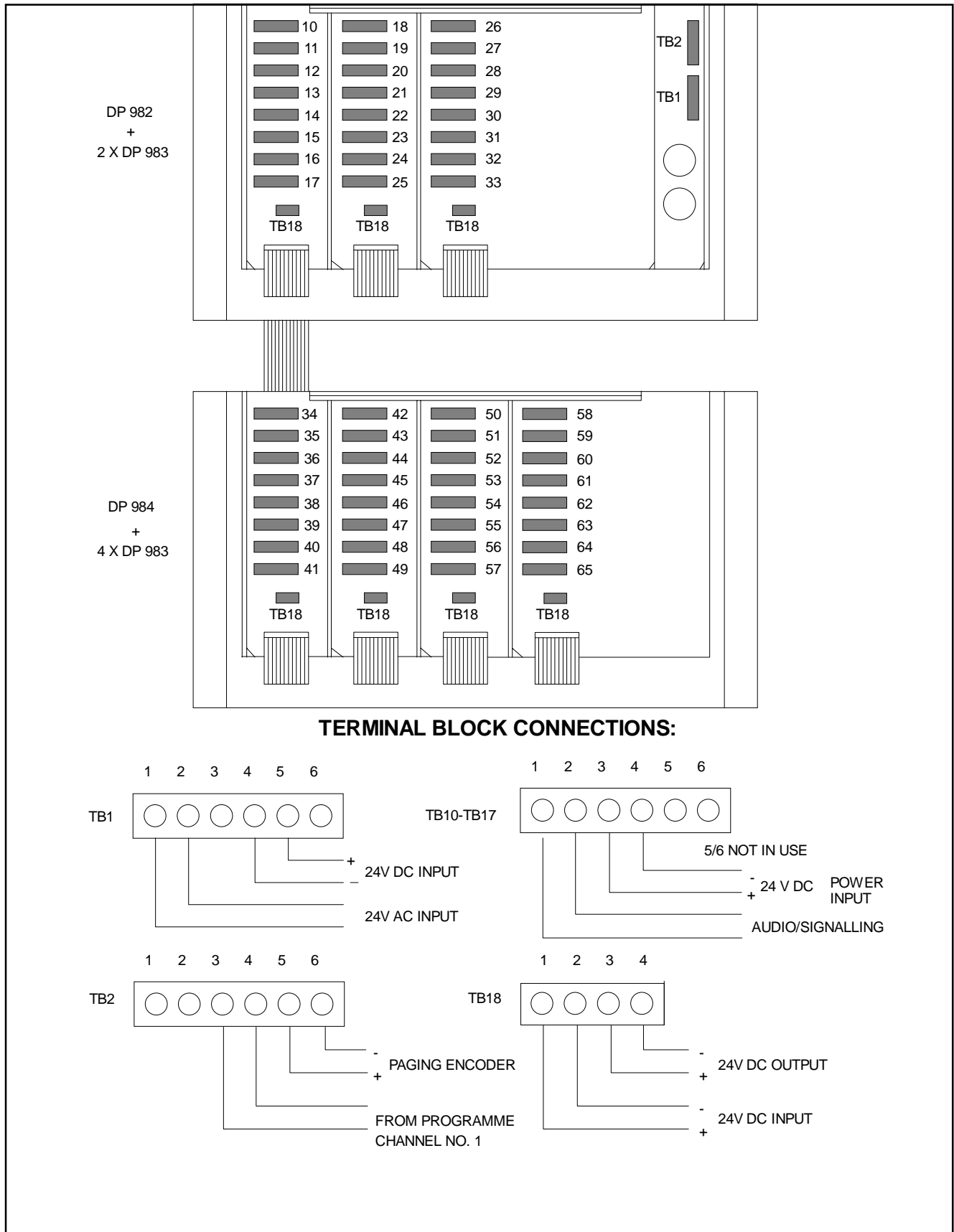
Station Terminal Programming:

All Individual Features (features related to specific call numbers) are programmed from a master station. Programming from several stations can take place simultaneously.

a. A master station plugged into line position no. 10. All call numbers with belonging individual features can be programmed.

b. A master station in any line position, the call number and belonging features to this specific line position can be programmed.

4.1. SWITCH-PROGRAMMING:

System Features:

The following System Features are programmable with switch setting of Switch Group U49 on Control Card NFE1643. The features are available when the corresponding switches are set to position ON.

SWITCH	FEATURE	NOTES:
1	Radio paging	
2	Secretary transfer/Call forward	
3	Call back	
4	Hurry up	
5	Call digits	ON=3 digit dialling (100-999) OFF=2 digit dialling (10-99)
6	Reset Battery RAM	ON=Reset to default numbering (10-65/100-155), timers, features.
7	Radio paging reply time	Reply to radio paging by "08"
8	Station Terminal Programming access (STP)	ON=enable STP OFF=disable STP

The following System Features are programmable with switch setting of Switch Group U48 on Control Card NFE1643. The features are available when the corresponding switches are set to position ON.

SWITCH	FEATURE	NOTES:
1	Not in use	
2	Conference	3 party conference
3	Programme distribution (music)	None or 2 program channels, can
4	Programme distribution (music)	be reduced to 1 by STP prog.

NOTE: Each time any switch configuration is changed to program System features, the S2 Reset button on the Control card NFE1643 must be pressed to rewrite the new feature information into the system's memory. This is also accomplished automatically when the system power switch, S1, is temporarily turned off.

The code 045 can also be dialled from the master station in line position 10 to rewrite the switchsetting into the memory, and in this case without resetting the central.

4.2. STATION TERMINAL PROGRAMMING,

Individual Features:

The following Individual Features are programmable with Station Terminal Programming (STP) by use of a master station:

Call number, program/delete
Group call members, program/delete
Call number privileges
Privacy mode
System timers
Individual subscriber timers
Direct access
Direct dialling
Subscriber hunt number
CAS-1 hunt number (programmable from line pos. 10 only).
CAS-2 hunt number (programmable from line pos. 10 only).
CAS-1 radio paging number (programmable from line pos. 10 only).
CAS-2 radio paging number (programmable from line pos. 10 only).

The following elements are involved in Station Terminal Programming of Individual features:

1. Programming Codes (PC)
2. Call Number Privilege
3. System and Individual timers

4.3. PROGRAMMING DETAILS

Call Numbers.

2 or 3 digit dialling is programmed by switch no. 5 on switch group U49.
If an undefined call number is dialled, the call setup is automatically cancelled.

Programming call numbers:
From line pos. 10   010 <line pos.> <call number>
From any line pos.   011 <call number>

If a new call number is programmed to a line position with an existing call number, the old call number is undefined. If a line position is given a call number already in use, this call number's original line position will be without call number.

Deleting call numbers:
From line pos. 10   (range of call nos.) 012 <from call number><to call number>
From line pos. 10   013 <call number>
From any line pos.   014
From line pos. 10   015 (range of line pos. nos.)<from line pos.> <to line pos.>
From line pos. 10   016 <line pos.>

All/Group Call

The call number for all call is 070.
The call numbers for the 8 groups are 071 to 078.
The RM5000 system has 8 group calls. The group no. 8 is also used as negative group in all call. Call numbers programmed into group no. 8 will not receive all call.
To program or delete a call number in/out from a group:

    1 = in (program into the specified group)
    0 = out (delete from the specified group)

If a call number is specified to be member of all group call groups, the code "0" is used.
Note: The call number will also be member of groupcall no. 8, "the neative group", and will not receive all-call. It should be deleted from group no. 8 in order to receive all-call.

From line pos. 10	(range of call nos.) 017 <from call number> <to call number> <group> <in/out>
From line pos. 10	018 <call number> <group> <in/out>
From any line pos.	019 <group> <in/out>

To access all call the caller must be programmed with the privilege "1". For group call the privilege is "2". See next paragraph, programming Call Number Privileges.

Call Number Privileges.

The following privileges can be programmed to a call number;

ID	PRIVILEGE/DEVICE	NOTE
0.		To set all privileges 1 to 5
1.	All call.	Access to all call.
2.	Group call	Access to group call (all 8 groups)
3.	Priority	The call number has priority
4.	CAS log on/off	Access to log on/off to the CAS groups
5.	Direct Dialling	Access to the Direct Dialling feature
6.	Auto paging (device)	Calls will always result i radio paging
7.	Visicall (device)	Visicall AE111, callers call no. in display.
8.	DTMF (device)	DTMF transmission device
9.	Simplex/duplex (device)	A call number operates in Simplex mode

To program or delete a privilege (in/out) to a call number:

    1 = in
    0 = out

From line pos. 10	(range of call nos.) 020 <from call number> <to call number> <privilege no.> <in/out>
From line pos. 10	021 <call number> <privilege no.> <in/out>
From any line pos.	022 <privilege no.><in/out>

Privacy.

The RM5000 system operates with 3 different privacy modes: (mode 1 is default)

Mode 1. Standard privacy (switch selectable)
The station's privacy switch controls the privacy status.
If the privacy switch is activated the incoming call will be forwarded to the Call Forward number or to the Hunt number, if any of these features is programmed. If not, a ringing

tone will be heard in both stations, and the called person can accept by pressing the "00" button.
If the calling person is programmed with Priority, he can override the privacy mode 1.

Mode 2. Always privacy.
The station is always privacy. Both stations will hear a ringing tone, and the called person can accept by pressing the "00"button.
If the privacy switch is activated the incoming call will be forwarded to the Call Forward number or to the Hunt number, if any of these features is programmed.
Even if the calling person is programmed with priority, he can not override the privacy mode 2.

Mode 3. Never privacy.
The call number is never privacy. All calls will go through.

From line pos. 10	(range of call nos.) 023 <from call number> <to call number> <privacy mode>
From line pos. 10	024 <call number> <privacy mode>
From any line pos.	025 <privacy mode>

System Timers

The following is a list of system timers. The system timers are valid to all call numbers. All time intervals can be changed by Station Terminal Programming, programming code 026. (* = 0 time duration is endless).
The time intervals are programmed in 100 milliseconds or 1 second.

ID	FEATURE/FUNCTION	DEFAULT TIME	TIME RANGE
01	All call duration	30 sec	0 - 600 sec *
02	Group call duration	30 sec	0 - 600 sec *
03	Privacy time-out	15 sec	0 - 600 sec *
04	All call warning tone	900 ms	0 - 2300 ms
05	Group call warning tone	900 ms	0 - 2300 ms
06	Ringing on CAS-1	15 sec	0 - 600 sec *
07	Time interval before hunt activation CAS-1	30 sec	0 - 600 sec *
08	Time before new ringing starts after cancellation CAS-1	2 sec	0 - 600 sec *
09	Ringing on CAS-2	15 sec	0 - 600 sec *
10	Time interval before hunt activation CAS-2	30 sec	0 - 600 sec *
11	Time before new ringing starts after cancellation CAS-2	2 sec	0 - 600 sec *

| From line pos. 10 | 026 <timer ID> <length> | (Timer ID=2 digits) (Length=3 digits) |

Individual Subscriber Timers

The following is a list of individual timers. All time intervals can be changed by Station Terminal Programming, progr. code 027-029. (* = 0 time duration is endless). The time intervals are programmed in 100 milliseconds or 1 second.

ID	FEATURE/FUNCTION	DEFAULT TIME	TIME RANGE
1	Direct dialling activation	1200 ms	0 - 2300 ms
2	Call length (related to A)	endless (0)	0 - 600 sec *
3	Warning tone (standard call)	1000 ms	0 - 2300 ms

Programming range:
> timers with the range 0-600sec., programming 000-600,
> timers with the range 0-2300ms, programming 000-023.

From line pos. 10   (range of call nos.) 027 <from call number> <to call number> <timer ID> <length>

From line pos. 10   028 <call number> <timer ID> <length>

From any line pos.   029 <timer ID> <length>

> (Timer ID=1 digit)
> (Length=3 digits)

Direct Access

For special substations with CALL button (AB917/918/919) or stations modified for DC shift initiative only.

From line pos. 10   (range of call nos.) 030 <from call number> <to call number> <direct access number>

From line pos. 10   031 <call number> <direct access number>

From any line pos.   032 <direct access number>

To delete a direct access number, specify the no. to be 000.

Direct Dialling

To each digit key (0-9) on the station's keypad a call number, feature code or programming code can be programmed. If the key is pressed, the preprogrammed code is activated after a preprogrammed time interval (individual timer for direct dialling activation, timer ID. no. 1). The code can be 3 digits maximum.

From line pos. 10   (range of call nos.) 033 <from call number> <to call number> <key> <direct dialling number>

From line pos. 10   034 <call number> <key> <direct dialling number>

From any line pos. *   035 <key> <direct dialling number>

To delete a direct dialling number, specify the no. to be 000.

*To program the Direct Dialling feature from any line position the call number must have been given the privilege no. 5. NOTE: The switch no. 8, switch-group U49, has no influence on programming of the Direct Dialling feature.

Hunt

Each call number can be programmed to have a hunt number. Several call numbers can have the same hunt number. If the called station is busy or in privacy, the call will be transferred to the hunt number (if programmed). The maximum of call numbers in a hunt chain is preset to 10, and if the 10'th station is reached, the call will then go to the called station even if the station is busy or in privacy.

From line pos. 10   (range of call nos.) 036 <from call number> <to call
                            number> <hunt number>
From line pos. 10   037 <call number> <hunt number>
From any line pos.   038 <hunt number>
To delete a hunt number, specify the number to be 000.

Central Answering Service (CAS).

The RM5000 system has two CAS groups, CAS-1 and CAS-2.
CAS-1.
The call number for CAS-1 is 054. To log on to CAS-1 the code is 050 and to log out
051. To the CAS-1 group a hunt number and a radio paging number can be programmed.
If no operators are logged on to the CAS-1 group, the call will be routed to the hunt
number (if programmed). The hunt number can be an ordinary call number (ex. the
switchboard), the other CAS-2 group or the same CAS-1 group. This way the call will
never be lost.
If a radio paging number is programmed in relation to the CAS-1 group, this will always
result in a radio page when the CAS-1 group is called.
From line pos. 10   039 <hunt number>
From line pos. 10   041 <radio paging number>
To delete a hunt/radio paging number, specify the nos. to be 000.

CAS-2.
The call number for CAS-2 is 055. To log on to CAS-2 the code is 052 and to log out is
053. To the CAS-2 group a hunt number and a radio paging number can be programmed.
If no operators are logged on to the CAS-2 group, the call will be routed to the hunt
number (if programmed). The hunt number can be an ordinary call number (ex. the
switchboard, the other CAS-1 group or the same CAS-2 group. This way the call will
never be lost.
If a radio paging number is programmed in relation to the CAS-2 group, this will always
result in a radio page when the CAS-2 group is called.

From line pos. 10   040 <hunt number>
From line pos. 10   042 <radio paging number>
To delete a hunt/radio paging number, specify the nos. to be 000.

To be a CAS operator (to have access to the CAS log on/out feature) the call number
must be programmed with the privilege 4.

General CAS information.
When a call number dials the CAS group, a ringing tone is heard in both the caller's and
CAS station. To accept the call, the CAS operator must press "00". If the call is not
accepted by the first CAS operator logged on, it will (after a pre-programmed time
interval, *System Timer id. no. 06 and 09*) be transferred to the next CAS operator logged
on.
A CAS operator can ignore a call by pressing the cancel button "X" (when ringing). This
results in sending the call to the next CAS operator logged on. If no CAS operator is
free, the caller will be connected to the Programme Distribution channel no. 1. Informa-
tion can be distributed from a tape recorder regarding the queue situation.
Ending a call, the operator cancel with the X button. If more calls in queue, the next call
will be delayed a preprogrammed time interval before it starts ringing, this to give the
operator the possibility to make an outgoing call (call for help, etc.). This delay is
programmed with the *System Timer id no. 08 and 11.*
If no operator is logged on to the CAS group, the call will be routed to its hunt number.
The time interval before the call is transferred to the CAS hunt number is programmed by
System Timer id no. 07 and 10.

**Programme
Distribution
Channels.
Location of
channel no. 2.**

System RM5000 can operate with one or two Program Distribution channels. By programming switches no. 3 and 4 Switchgroup U48, (position ON), two channels are available as default. The source for channel no. 1 should be terminated to screwterminal TB2, terminal 3 and 4.
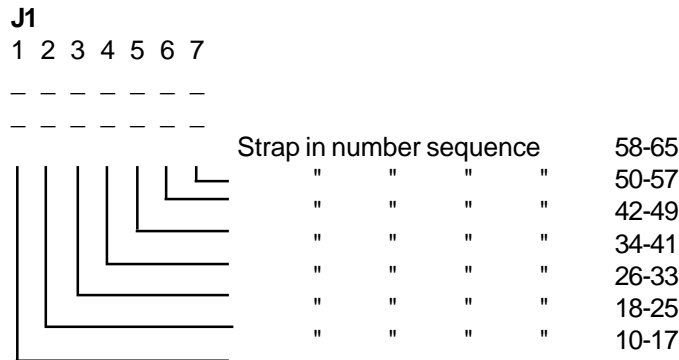
Channel no. 2 is as default located to line position 17 (last position on the Control Card NFE1643). By STP programming, the location of channel no. 2 can be allocated to any line position in the system. If required, the channel no. 2 can be removed from the system by allocating line position 00. The programming code is 043.

From line pos. 10   043 <line pos>

To eliminate program distribution channel no. 2, dial: 04300

4.4. LINE POSITION SEQUENCE PROGRAMMING

To select line position sequence programming must be carried out on each Subscriber Card NFE1643. Any card can be programmed to have any 8-number sequence, e.g., 10-17, 18-25, 26-33 etc. Set strap on matrix J1 in the following positions for programming:

J1
```
1  2  3  4  5  6  7
_  _  _  _  _  _  _
_  _  _  _  _  _  _
                      Strap in number sequence      58-65
                        "        "      "      "      50-57
                        "        "      "      "      42-49
                        "        "      "      "      34-41
                        "        "      "      "      26-33
                        "        "      "      "      18-25
                        "        "      "      "      10-17
```

NOTE: All Subscriber Card NFE1643 are delivered with the strap in position 2 (18-25).
Do not forget to change position when cards are installed i positions 3 to 7.

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5. Technical Specifications

5.1. TECHNICAL DATA - MASTER STATION AA916.

Operating voltage	21 - 28.5V DC
Current drain microphone on	0.1A
Current drain loudspeaker on, max	0.2A
Current drain loudspeaker on, normal	0.1A
Current drain station free	0.015A
Power consumption, approx	5W
Amplifier output power, max.	2W
Amplifier output power, normal	0.1 - 0.2W
Station sensitivity	0.3V/uB
Loudspeaker impedance	50 ohm
Handset/earphone impedance	50 ohm
Extra loudspeaker (to wall socket pin 5 and 6)	min. 16 ohm.
Switching level	16 - 27 dB
Volume control regulation	+/-10dBm
Dimensions	Height 64mm/2.5"
	Width 65mm/2.6"
	Length 214mm/8.4"
	Weight 300gr
Colours	Black/grey/white/red

5.2. TECHNICAL DATA - CENTRAL UNIT RM5000

Central supply voltage	24V AC +-10% 50/60Hz or 24V DC from rectifier/battery
Internal central voltage:	
CMOS integrated circuits	0 - 10V
TTL integrated circuits	0 - 5V
Power consumption motherboard, approx	20W
Power consumption subscriber card (8 subscribers)	1W
Power supply for all-call/group call/ music distribution ONLY valid for centrals above 24 subscribers	24V DC/4A
Maximum input to music distribution channel	100 mV rms

Line requirements:

> 2 individual leads for all system information and transmission
> 2 common leads for power supply

Dimensions, Basic Cardrack DP982	Height, 270 mm,10.6"
(for 24 subscribers)	Width, 440 mm,17.4"
Same size on expansion cardrack DP984	Depth, 150 mm, 5.9"
Ambient temperature:	0 - 35°C, (32 - 95°F)
Colour	Pearl grey

5.3. LINE SPECIFICATIONS

Galvanic line:

Frequency range	300 - 5000Hz
Speech level, idling	-12dBm
Speech level, max	-6dBm
Signalling level	-10dBm
Signalling frequencies	CCITT specifications

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**The company reserves the right to modify designs and alter specifications
without notice, in pursuance of a policy of continuous improvement.**

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