NORTHERN TELECOM PRACTICE
Cook Electric Division

NT7M SERIES DIGITAL ANNOUNCERS

EQUIPMENT DESCRIPTION

1. GENERAL INFORMATION

OVERVIEW

1.01   The NT7M Series of Digital Announcers products are designed to provide automatic voice message(s) over standard telephone lines. The Announcer may be used as a stand-alone unit, interfaced with other Digital Announcers and/or in conjunction with other equipment, such as Central Office or PBX telephone switches, telephone information centers, etc.

1.02   References

60-NT7M-200   NT7M Series Digital Announcer Installation Procedures

60-NT7M-3xx   NT7M Series Digital Announcer Operating Procedures (several)

60-NT7M-400   NT7M Series Digital Announcer Maintenance Procedures

For additional information, contact:

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    Cook Electric Division
    6201 Oakton Street
    Morton Grove, IL   60053-2722 USA
        Telephone   (708) 967-1555
        Telex I   72-4472
        Telex II   910-223-3654

SECTION 060-NT7M-100

ADVANTAGES

1.02   Because of digital technology, the
       NT7M Series of Digital Announcer
products provide significant advantages
over less sophisticated products. The
advantages are:

    (1)   Improved audio quality and
          message lifespan by eliminating
          drum and tape wear and dirt
          accumulation.

    (2)   Reduced space requirements
          allowing stand-alone usage.

    (3)   Reduced power consumption.

    (4)   Reduced maintenance through
          reduced scheduled maintenance
          and increased reliability.

    (5)   Significant cost reduction
          because of the items just
          listed.

1.03   The Digital Announcer has a number
       of options and user selectable
features which provide configurations for
a wide range of applications. These
options are discussed in greater detail
in paragraph 3, Product Description.

2.   PURPOSE OF EQUIPMENT

INTENDED USES

2.01   The Digital Announcer is the
          functional equivalent to the
electromechanical announcers frequently
used for audio intercept messages (for
instance, all lines are busy, a telephone
number has changed, no service is
available after regular office hours,
etc.). The Digital Announcer may be used
as a direct drop-in replacement for
existing drum, tape, or cassette type
devices.

2.02   The Digital Announcer lends
          itself well to original
equipment applications which require
repetition of the same message.

INTERFACE REQUIREMENTS

2.03   The Digital Announcer may be
          directly connected to a
subscriber line through RJ-11 jacks or
through hardware, wire-wrap connection
directly to other equipment. The manner
in which the announcer is to be connected
depends on the options selected.

2.04   Specifics concerning the interface
       of Digital Announcer equipment are
discussed in the appropriate installation
and options manual.

INAPPROPRIATE APPLICATIONS

2.05   The Digital Announcer is designed
       for applications where no user
response is expected to the message
(listen only). It is not intended to be
used as a form of telephone answering
machine. The Announcer is not set up to
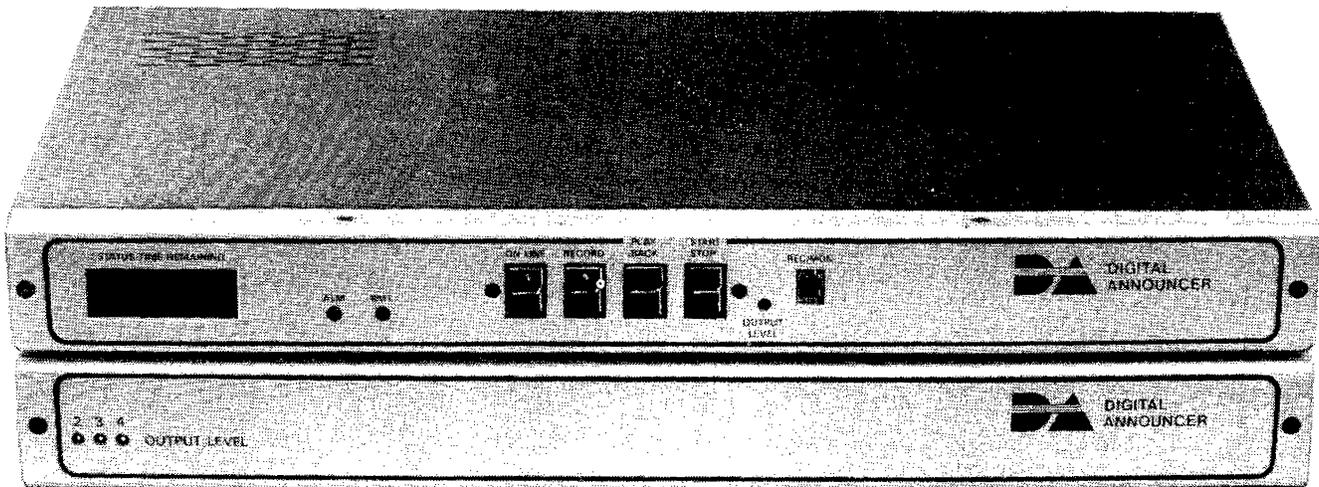store several messages in sequence.

3.   PRODUCT DESCRIPTION

3.01   The Digital Announcer consists of
       a metal cabinet (Control Processor
Chassis) which can be used as-is or may
be adapted to rack mounts by a variety of
side brackets kits. Because of the many
options and features which may be
selected, a second enclosure (Expansion
Chassis) is often necessary for the extra
circuits. Digital Announcer chassis
configurations are shown in figure 1.
Location of major assemblies and optional
assemblies are shown in figure 2. The
Digital Announcer is completely self-
contained, requiring only external power,
audio and signal connections.

PRODUCT SPECIFICATIONS

3.02   Specifications for the Digital
          Announcer vary with the number
of features and options selected. The
Standard Digital Announcer specifications
are detailed in Table 1. Table 2 details
the specifications for the unit with
installed options. Specifics concerning
each of the options available for the
Digital Announcer line of products are
contained in documentation for the
option.
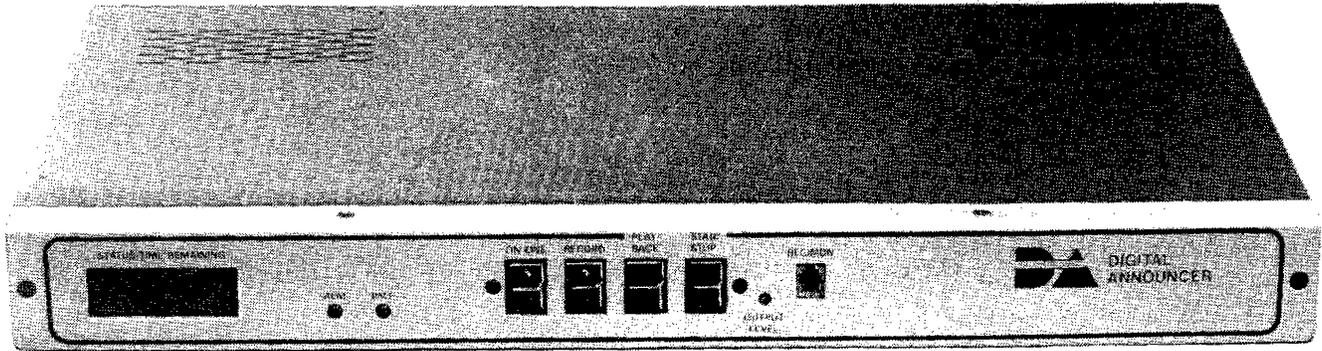
ONE OR TWO CHANNEL UNITS

THREE OR FOUR CHANNEL UNITS

Fig. 1 - Digital Announcer Configurations

SECTION 060-NT7M-100

EPROM WITH OPERATING PROGRAM (CHOOSE ONE OF SEVERAL)

RECHARGEABLE BATTERY PACK (OPTIONAL)

REMOTE, AUDIO, OR INTERFACE CIRCUITS (OPTIONAL)

MAIN CIRCUIT BOARD (STANDARD EQUIPMENT FOR ALL MODELS)

ADDITIONAL MESSAGE MEMORY CIRCUITS (OPTIONAL)

MEMORY EXPANSION

CONTROL PROCESSOR CHASSIS

AUDIO CIRCUITS (STANDARD EQUIPMENT FOR SOME MODELS)
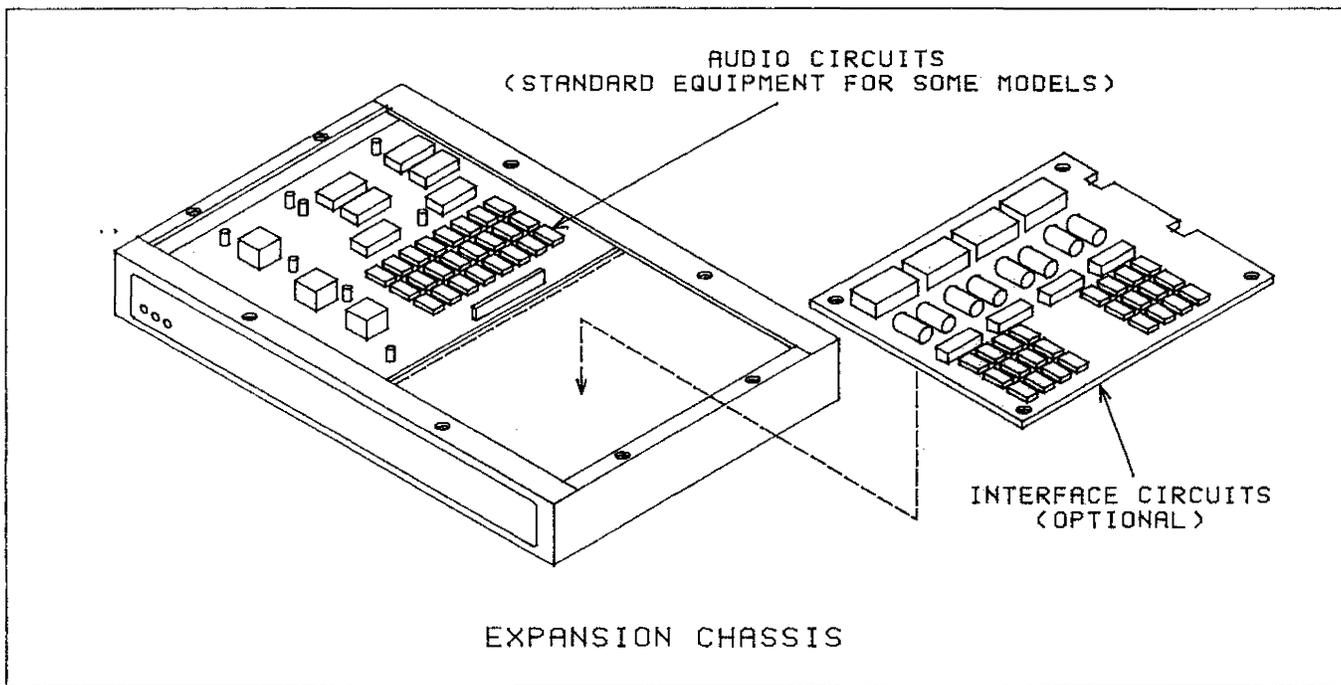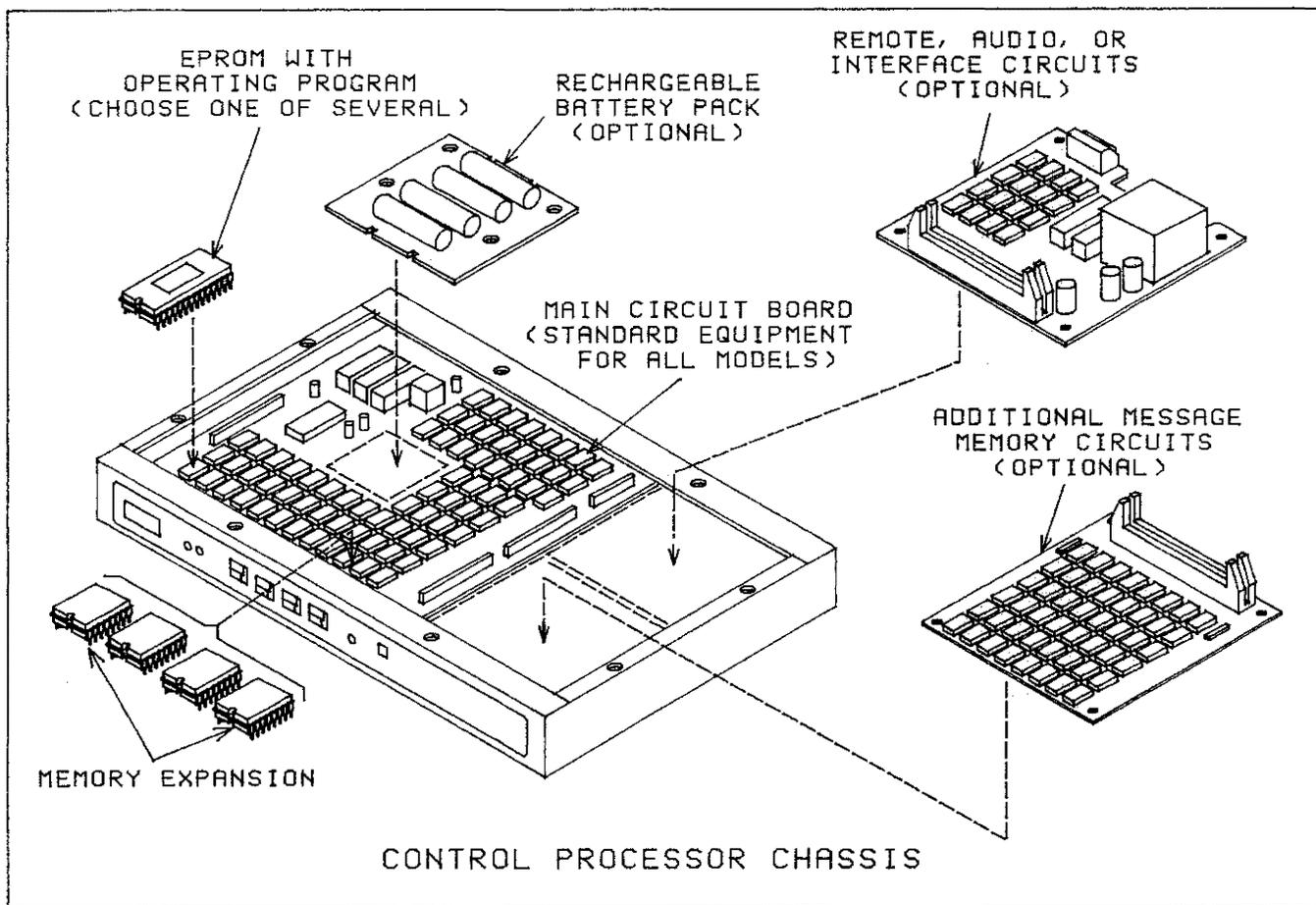
INTERFACE CIRCUITS (OPTIONAL)

EXPANSION CHASSIS

Fig. 2 - Location of Digital Announcer Options

Table 1. Digital Announcer Specifications*

CHARACTERISTIC	DESCRIPTION
Power Consumption	-42 to -66 VDC at 400 mA max. (approximately 20 W at 50 V)
Circuit Protection	1 Ampere, 3AG Slow-Blow fuse (one per chassis)
Interconnection	Audio, Power, Control, and Alarm (Wire-wrap, 20-pin connector)
Environmental	0° to 50°C (32° to 122°F) - operating. -40° to 70°C (-40° to 160°F) - storage. 10% to 90% Relative Humidity (non-condensing)
Exterior Finish	Silver w/Black letters, Brown w/White or custom ordered
Physical Dimensions	Height: 1.75 inches (44.5 mm) (Single Chassis) Height: 3.50 inches (89.0 mm) (Two Chassis) Width: 17.5 inches (445 mm) Depth: 12.0 inches (305 mm)
Weight	5 pounds with options (Single Chassis) 10 pound with options (Two Chassis)
Message Capacity	Defined by the Firmware and Memory options selected
Signal to Noise Ratio	$\geq$45 dB, C message weighted, referred to 0 dBm output (32 kHz)
Audio Input	Approximately 250 millivolts AC rms at Record/Monitor jack)
Audio Output	Firmware selectable (Max. of 2 per chassis). Transformer Coupled Balanced Output (Tip and Ring) at $\geq$4 ohms Load Impedance. Max. of 200, 900-Ohm lines or 150, 600-Ohm lines Level continuously adjustable to +5 dBm (pre-set to -9 dBm)
Frequency Response	$\geq$300 Hz ($\pm$1 dB) to 3 kHz (+1/-6 dB) @ 0 dBm Output (300 Hz to 2.1 kHz, $\pm$1 dB)
Harmonic Distortion	$\leq$6% THD with 0.775V rms output into 4 ohm resistive load (measured with -10 dBm, 1 kHz sine wave audio input)
Control Signals	1 Start: -42 to -66 VDC at 10 mA 1 C/MC: Form C relay contacts rated 4 A at 48 VDC resistive 1 MBY: Form C relay contacts rated 4 A at 48 VDC resistive 1 ALM: Form C relay contacts rated 4 A at 48 VDC resistive
Memory Size (single)	32 (or 64) seconds min., max. of 128 sec. (Single Chassis 64 seconds min.; Max. of 512 sec. (Two Chassis)
Compliance	FCC Class A computing device pursuant to Subpart J of Part 15 Output power pre-set to -9 dBm per Part 68 of FCC rules FCC Registered Product No. D5F982-13986-PX-N UL Recognized Product File No. E106428(N)

* NOTE: All specifications listed are measured using the 32 kHz sampling rate as set at the factory.

SECTION 060-NT7M-100

Table 2. Digital Announcer Specifications* (with Options**)

CHARACTERISTIC	DESCRIPTION
Memory Size	Up to 128 seconds (Up to 512 seconds with Expanded Memory)
Message Retention (Battery Backup)	128 seconds of memory - 3.0 hours, 512 seconds - 1.3 hours (measured at 25°C, new batteries and full charge)
Audio Expansion	2 fully-independent, identical Audio Outputs
Control Signals	Two (2) Start: -42 to -66 VDC at 10 mA Two (2) C/MC: Form C relays rated 4 A at 48 VDC resistive Two (2) MBY: Form C relays rated 4 A at 48 VDC resistive One (1) ALM: Form C relays rated 4 A at 48 VDC resistive
Remote Access	Record and Playback (DTMF phone) w/Remote Record/Ring Trip option
Telephone Line Interface	Responds to standard telephone ringing signals (connection via RJ-11 modular jack) with Ring Trip Access option
AC Line Power	120 VAC operation with AC Convertor accessory
Rack Mounting	EIA, RETMA, or Bell standard enclosures

* NOTE: All specifications listed are measured using the 32 kHz sampling rate as set at the factory.

** All specifications for units with options installed are the same as units without options installed unless otherwise specified.

THEORY OF OPERATION

3.03   Since the operation of the Digital Announcer is based on the operating instructions (firmware), only a general overview is presented here. Further information concerning this operation is discussed in the appropriate program operation manual which is shipped with each unit. In general, an analog voice announcement is converted to digital data and stored in memory. When the appropriate signals are received from the interface circuits, the message is converted to analog for output to the line requesting the message.

HARDWARE CONFIGURATION

3.04   The Digital Announcer products consist of a Control Processor Chassis and, if required, one or more Expansion Chassis. The Control Processor Chassis is required as part of the base unit.

3.05   The Control Processor Chassis (CPC) provides the operator interface and controls for the digital announcer. The CPC contains the microprocessor, memory (message storage), signal, control, and power supply circuitry and space for the optional additional (second channel) message memory and interface options circuit boards.

3.06   The Expansion Chassis comes in two distinct models. The Standard Expansion Chassis and the Line Expansion Chassis. These chassis are identical except for the rear panel.

3.07   The Standard Expansion Chassis is designed to contain the audio expansion circuits and interface circuits. These circuits are discussed in greater detail in paragraph 4, Options.

3.08   The Line Expansion Chassis is specifically designed to provide for multi-line access to the Digital Announcer. The chassis allows for the addition of eight subscriber lines to a single Control Processor Chassis or a CPC, expansion chassis combination. The expansion chassis may be daisychained to allow up to 200 input lines to a single digital announcer (Refer to the Multi-Line Ring Trip Access Expansion Chassis Equipment Description, Installation, and Operation, Section 060-NT7M-203).

INTERFACE CIRCUITS

3.09   The interface is especially important in cases where several lines have access to a message. The interface is responsible for handling multiple requests (i.e., busy, barge-in, automatic call distribution, etc.). The interface circuits provide impedance matching and furnish the Announcer with start signals; the Announcer returns control signals, status, and alarm to the other equipment through the interface.

3.10   Digital Announcer options which supply interface to other equipment are described in paragraph 4, Options.

3.11   The customer may supply interface circuits to the Digital Announcer. For customer supplied interface circuits, refer to Digital Announcer specifications (Tables 1 and 2) and/or the appropriate option(s) manual as required.

CAUTION: To avoid damage, take care to supply the interface to mate the characteristics of the Announcer to the attached equipment or audio distribution network.

FIRMWARE CONFIGURATION

3.12   Operating Instructions for the Digital Announcer are contained in EPROM's. These socketed firmware chips can be changed in the field. The program options are detailed in Table 3. Programs are outlined in Table 4. More detailed information is contained in the appropriate Program Operation Manual.

SECTION 060-NT7M-100

Table 3. Firmware Options

NUMBER OF KIT	PROGRAM NAME	AUDIO OUTPUTS	MESSAGES AVAILABLE	START INPUTS	MESSAGE LENGTH	MESSAGE ACCESS
ONE CHANNEL PROGRAMS						
NT7M90AA	BASIC	1	1	1	Variable	Immediate
NT7M908A	ASCII CODE START	1	8	1	Variable	Immediate
TWO CHANNEL PROGRAMS						
NT7M92AA	BASIC	2	2	2	Variable	Immediate
THREE CHANNEL PROGRAMS						
NT7M93AA	DEMAND PHASE SPLIT MEMORY	3	1	3	Variable*	Immediate
NT7M93BA	DEMAND PHASED TAPE EMULATOR	3	1	3	Variable*	Immediate
NT7M93DA	TIME PHASED SPLIT MEMORY	3	1	1	Variable*	Immediate
FOUR CHANNEL PROGRAMS						
NT7M91AA	BASIC	4	4	4	Variable	Immediate
NT7M91BA	SYNCHRONOUS	4	4	1	Fixed	Immediate
NT7M91CA	DEMAND PHASED ENTRY	4	1	4	Variable	Immediate
NT7M91DA	FIXED MESSAGE LENGTH	4	4	4	Fixed	Immediate

* Maximum message length of any Three Channel Program is restricted to half of the total memory capacity. Half of memory is reserved for the alternate announcement.

Table 4. Firmware Programs

PROGRAM	DESCRIPTION
COMMON PROGRAMS	
Operational Status	Indicates mode of operation (i.e., Select, On-Line, Alarm, etc.) on front panel LED display.
Memory Usage	Displays the amount of available memory (in seconds) and provides a real time count down during recording or playback.
Channel Activity	Displays active Audio output channels by number.
Remote Operation	Illuminates a dedicated Remote indicator lamp when the Announcer has accepted the security code and is under remote control
Fault Diagnostics	Built-In-Test - Alarm indicator illuminates on fault detections
Peg Count	Displays a running total of message requests (up to 999,999)
Extra Equipment	Allows the user to program up to 20 C/MC relay Control Signals operations for use as timing references or external device control
Special Information Tones	Allows the addition of industry standard tone patterns to the beginning of messages for electronic announcement identification
SPECIFIC PROGRAMS	
Basic	Provides all characteristics of common programs (differs only in the number of audio outputs).
ASCII Code Start	Allows ASCII code identification of messages (the Announcer may be controlled by a computer terminal, a P.C. or C.O. equipment).
Fixed Message Length	Allows memory to be partitioned into sections equally divided by the number of audio outputs (i.e., each channel gets the maximum, equal message time).
Synchronous	Provides fixed message lengths and simultaneous start times similar to mechanical type drum announcers.
Demand Phased Entry	Provides multiple request for one message (only one message may be recorded, but it is available on all outputs independently)
Demand Phased Split	Same as Demand Phased Entry except half of memory is reserved for an alternate message.
Demand Phased Tape Emulator	Provides a two second delay after both the active and the alternate message to simulate rewind time of tape machines.
Time Phased Split Memory	Same as Demand Phased Split except the second and third output of the outgoing message lag the original by 33% and 66% of memory length.

SECTION 060-NT7M-100

4. DIGITAL ANNOUNCER OPTIONS

4.01 Options are available to modify or
      enhance the operation of the
Digital Announcers. Each option has
unique features which are selected by the
user to match his specific requirements.
Options must be ordered from the factory.
In some cases options may be installed as
a field retrofit. The features for any
given option are determined by switches,
jumpers, program subroutines or other
operator action. Each option comes with
installation and operating instructions.
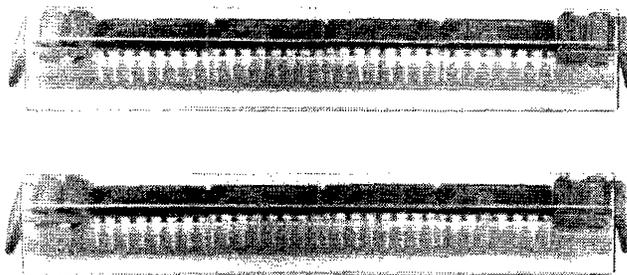
MEMORY EXPANSION

4.02 The Digital Announcer has enough
      memory to store approximately 64
seconds of announcement time. The
maximum amount of memory which can be
used is equal to about 518 seconds. The
announcer can accommodate up to 128
seconds of memory in sockets on the main
circuit board. Memory (message length)
is extended by installing additional RAM
in groups of four or eight chips (32 and
64 seconds of message). Refer figure 3.

EXTENDED MEMORY CIRCUIT

4.03 For applications which require
      more than 128 seconds of message
time, an Extended Memory Circuit Board
(figure 4) is available. This memory
board mounts next to the main circuit
board in the Control Processor Chassis
and provides additional sockets for
another 384 seconds of message storage
RAM chips. Memory may be added to this
board in groups of four chips (32 sec) or
eight chips (64 seconds) until a maximum
of approximately 518 seconds is reached.
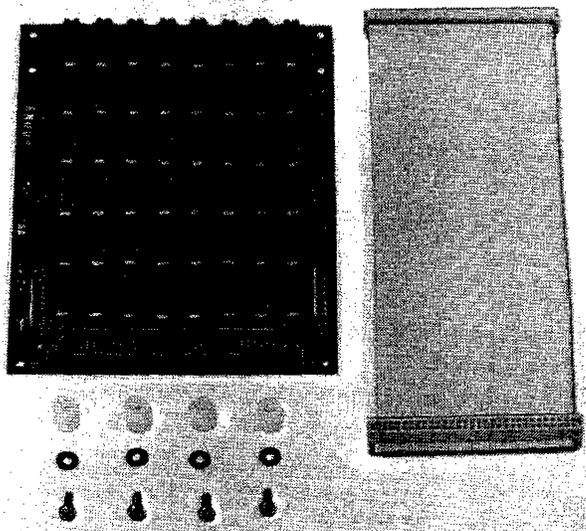The following list shows memory for 64
second chip sets.

Fig. 3 - Memory Expansion
Part No. NT7M04CA (32 sec., 1 Ch.only)
Part No. NT7M04AA (64 sec.)

Fig. 4 - Extended Memory Circuit
Part No.NT7M10BA

Number of kits	Number of ICs	Seconds at 32kHz	Seconds at 22kHz
1 *	8	64	92
2	16	128	184
3 *	24	192	276
4	32	256	368

Number of kits	Number of ICs	Seconds at 32kHz	Seconds at 22kHz
5	40	320	460
6	48	384	553
7	56	448	645
8	64	512	737

* These memory circuits are always factory installed.

SECTION 060-NT7M-100

ONE LINE RING TRIP ACCESS

4.04   The Ring Trip Access option
        (figure 5) matches the Digital
Announcer output characteristics to a
subscriber telephone line. This permits
the unit to operate as a stand-alone
device without the usual dependence on
Central Office or PBX equipment. This
option has provisions to adjust line
impedance, ring count, number of message
repetitions, Barge-In type operation,
etc. One Ring Trip Access circuit is
required for each telephone line; several
Ring Trip Access circuits may be wired in
parallel if necessary. For more
information refer to the Ring Trip Access
Equipment Description, Installation, and
Operation Manual (060-NT7M-351).
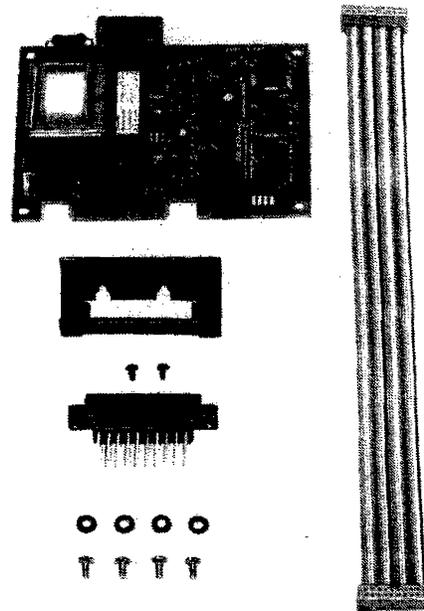
FCC Registration No. D5F982-13556-VP-N

Fig. 5 - One Line Ring Trip Access Kit
Part No. NT7M08BA

RING TRIP/REMOTE RECORD

4.05   The Ring Trip/Remote Record option
        (figure 6) combines a subscriber
line interface with a remote access
circuit. Remote Record allows the
Announcer to accept message changes from
a Dual Tone Multiple Frequency (DTMF)
telephone (trademark names such as Touch
Tone*, Digitone**, etc.). Programmable
access codes provide security against
unauthorized message changes. Ring Trip
Access matches the Digital Announcer to a
subscriber telephone line as previously
described. The remote Record and Ring
Trip functions may be disabled in-
dependently without interaction. For
more information refer to the Ring Trip/
Remote Access Equipment Description
Installation and Operation Manual (060-
NT7M-311).
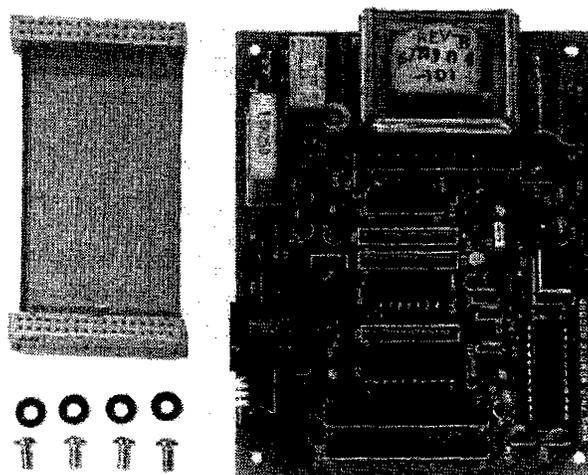
FCC Registration No. D5F982-14715-VP-N

Fig. 6 - Ring Trip/Remote Record Kit
Part No. NT7M07BA

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*   Trademark of AT&T
** Trademark of Northern Telecom

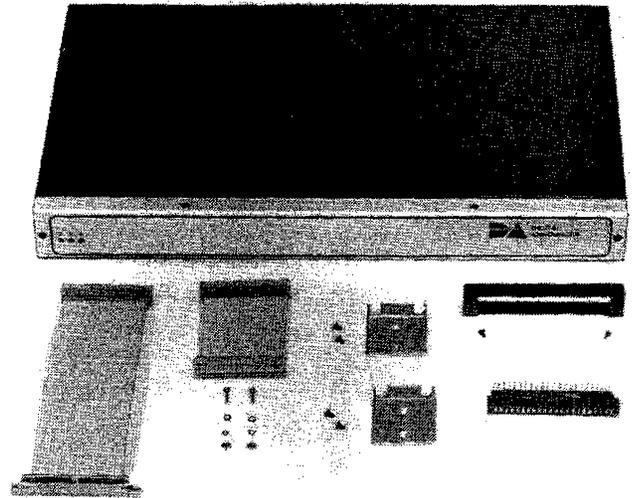SECTION 060-NT7M-100

THREE CHANNEL AUDIO EXPANSION

4.06   A Three Channel Audio Expansion is
       available to increase the audio
capacity of single output Digital
Announcers to four fully independent
audio outputs. The circuit board
contains all of the components for the
audio circuit. Data and control signals
are taken from the main circuit board via
an external ribbon cable. Additional
sets of relay contacts are also provided
to allow each of the audio circuits to
control external equipment.

4.07   The Three Channel Audio Expansion
       mounts in the Expansion Chassis
and has its own power supply (figure 7).
The operation of the additional channels
is controlled by the characteristics of
the firmware selected.

4.08   Upgrade with this option will
       require a firmware change to
control the additional audio output.
Operation and installation of the
firmware is detailed in the Installation
and Operation manuals supplied with the
option.

FOUR LINE RING TRIP ACCESS

4.09   Four Line Ring Trip Access option
       (figure 8) which matches the
Digital Announcer output characteristics
to four subscriber telephone lines,
permitting the unit to operate as a
stand-alone device without the usual
dependence on Central Office or PBX
Equipment. It has provisions to adjust
line impedance, ring count, number of
message repetitions, Barge-In type
operations, etc. Four Line Ring Trip
Access circuits may be wired in parallel
if more than four telephone lines must
receive the recorded announcements. For
more information refer to the Four LIne
Ring Trip Equipment Description
Installation and Operation Manual (060-
NT7M-354). This option may be added to
the Expansion Chassis and is also
included in the Multi-Line Ring Trip
Access option (Refer to paragraph 4.10).

NT7M26BA
Fig. 7 - Three Channel Expansion Kit
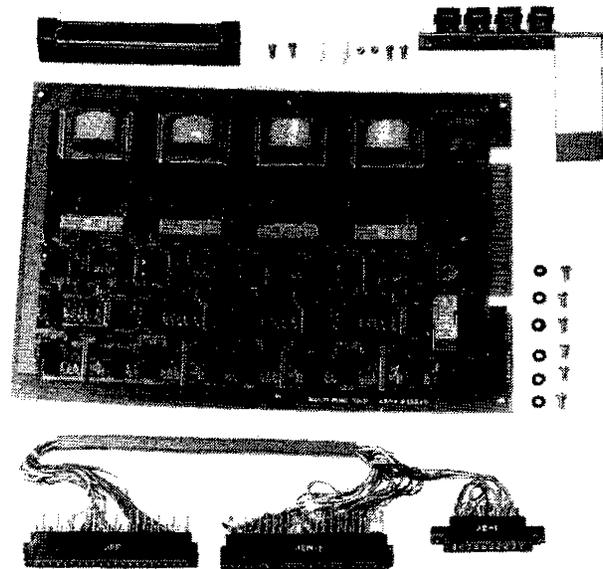
FCC Registration No. D5F982-13556-VP-N

Fig. 8 - Four Line Ring Trip Access Kit
Part No. NT7M07BA

LINE EXPANSION

4.10   The Line Expansion Kit (figure 9)
        is used applications where several
independent telephone line pairs or audio
circuits must have access to one voice
announcement. The Line Expansion uses a
pair of Four Line Ring Trip Access
Circuits in the Multi-Line Digital
Announcer Chassis. The Four Line Ring
Trip Access option has been previously
described.

4.11   The Line Expansion Kit provides
        connections for up to eight
separate subscriber telephone lines.
This option may be daisychained to allow
many input lines access to a single
digital announcer (150, 600-Ohm lines or
200, 900-Ohm lines). For more details
refer to the Multi-Line Ring Trip Access
Expansion Chassis Equipment Description,
Installation, and Operation, Section
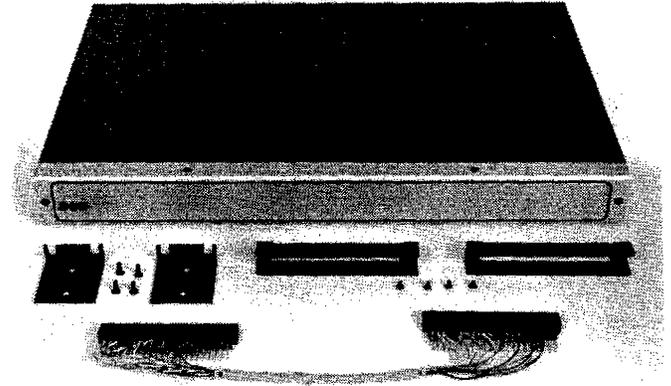060-NT7M-203.

Fig. 9 - Line Expansion Kit
Part No. NT7M29CA

DIGITAL ANNOUNCER DISTRIBUTION SYSTEM

4.12   The Digital Announcer Distribution
        System (figure 10) allows up to
five Digital Announcers (20 messages) to
be connected to a maximum of 375 audio
circuits per connector bank. The
connector banks are constructed with
Northern Telecom BIX modular cross-
connect wiring blocks, which serve as a
termination point between equipment
interfaces and Digital Announcers.
(Consult the manufacturer for assistance
in selecting the Distribution System
which best matches your specific
application.)

4.13   The Distribution System has a
        built in matching network for each
of the audio output pairs to allow direct
connection to existing telephone circuits
without modification. Control signal
wiring for each announcement is also
brought out to the terminal blocks. The
modular construction of the Digital
Announcer Distribution System permits
mounting in standard equipment frames,
and easily accommodates future expansion
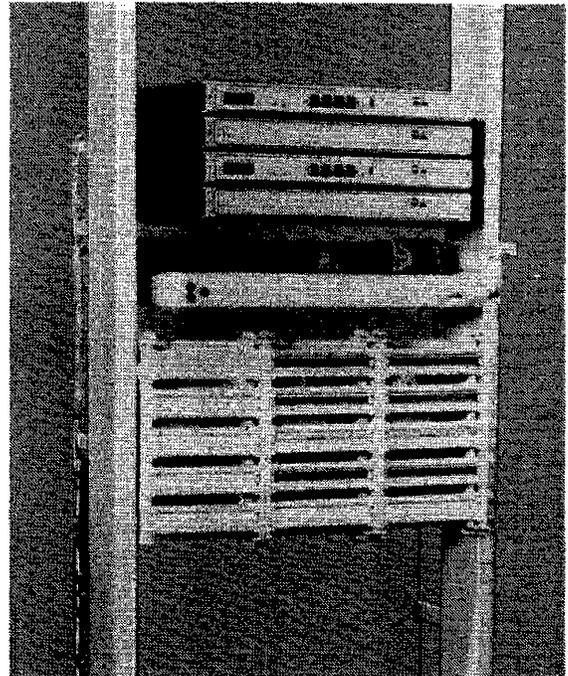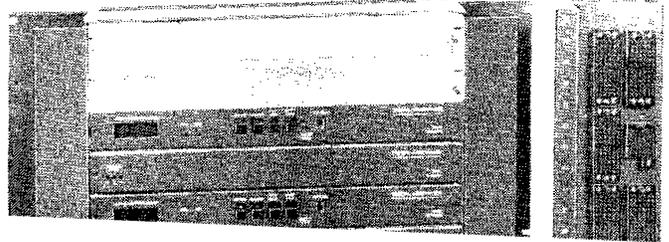in groups of 25 pairs.

Fig. 10 - Announcer Distribution System
Part No. 214600

SECTION 060-NT7M-100

DMS-10 INTERFACE

4.14   Digital Announcers may also be
       used in conjunction with telephone
switching equipment to provide electronic
announcement capabilities. The DMS-10
Digital Announcer System Interface
(figure 11) provides up to twelve
individual messages in a plug compatible
equipment module. This system fits into
the space normally occupied by analog
message announcement equipment. A quick-

SECTION 060-NT7M-100

DMS-10 INTERFACE

4.14   Digital Announcers may also be
       used in conjunction with telephone
switching equipment to provide electronic
announcement capabilities. The DMS-10
Digital Announcer System Interface
(figure 11) provides up to twelve
individual messages in a plug compatible
equipment module. This system fits into
the space normally occupied by analog
message announcement equipment. A quick-
release rack mount holds the interface
and up to three Digital Announcers.

4.15   Each audio message may supply as
       many as twelve access circuits
simultaneously, so that a maximum of 144
calls may be electronically announced
within the DMS switching network. Each
audio message may be turned off
independently without affecting any of
the other recorded announcements.
Circuits are alsoprovided to permit
testing for all of the detectable
announcement faults recognized by the
DMS-10 switch so that any alarm may be
verified without disrupting telephone
service.

5. ACCESSORIES

CASSETTE ADAPTOR CORD

5.01   The Cassette Adapter Cord
       (figure 12) has a miniature phone
plug and an RJ-11 modular line plug on
opposite ends of a 3-foot coiled cord.
With this accessory, audio may be taken
from an audio cassette player and loaded
directly into a Digital Announcer without
picking up background or ambient noises.

STANDARD PHONE HANDSET

5.02   A Standard Phone Handset
       (figure 13) is available for
monitoring messages and making live audio
recordings. The Handset has the correct
impedance (less than 1000 ohms) which is
required to properly match the input cir-
cuits of the Digital Announcer. The
Handset comes with a 3-foot coiled cord
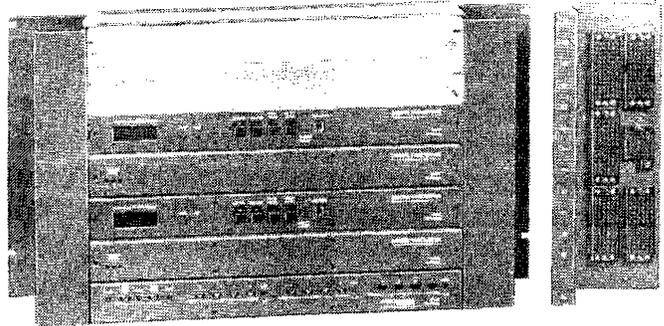with RJ-11 modular handset plugs on both
ends.

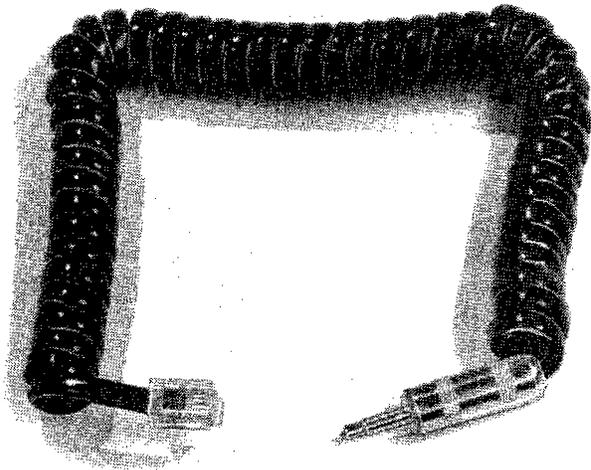**Fig. 11 - DMS-10 Interface System**
Part No. 215000
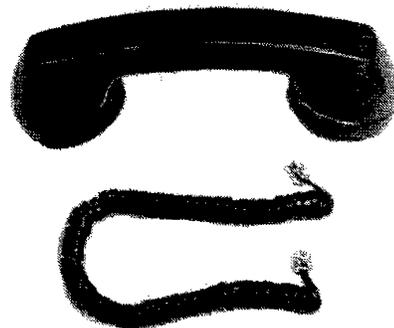
Fig. 12 - Cassette Adaptor Cord
Part No. 213284

Fig. 13 - Standard Phone Handset
Part No. 213285

Page 14

MODIFIED PHONE SET

5.03   The Modified Phone Handset
        (figure 14) of the features of the
Standard Handset, but it also includes a
miniature phone jack and an interconnect
cord to permit direct connection to a
cassette player or other audio source.
The jack automatically disconnects the
handset transmitter, allowing recording
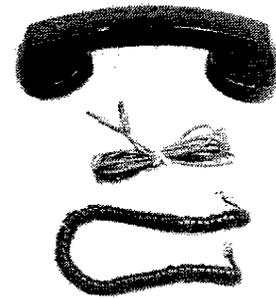without noise pickup.

RECHARGEABLE BATTERY PACK

5.04   The Rechargeable Batteries used to
        provide memory backup in the
Digital Announcer may be replaced without
need for factory service. The battery
pack consists of four cells permanently
mounted onto a circuit board assembly
(figure 15). The board is keyed to
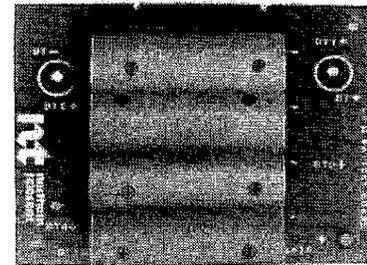prevent incorrect installation.

TELEPHONE MESSAGE CASSETTE

5.05   The Standard Telephone Message
        Cassette (figure 16) has 54 pre-
recorded intercept messages of the type
frequently used to instruct PBX and
Central Office customers. These an-
nouncements cover many of the problems
encountered in normal telephone traffic.
Each message is recorded twice, one side
with a male voice the other side with a
female voice.

AC POWER CONVERTOR

5.06   The AC Power Convertor (figure 17)
        can provide a source of 50 VDC
power when the Digital Announcer must be
operated outside of the normal telephone
equipment environment. The Convertor
uses standard (120 VAC) line voltage. It
features EMI/RFI control, automatic over-
temperature and overcurrent protection,
and a pre-wired connector.

5.07   The AC Convertor is a U.L. listed
        device. Each Chassis in the
system must have a AC Convertor if line
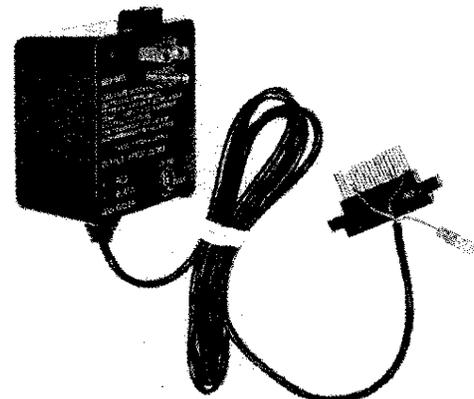voltage power is used.

Fig. 14 - **Modified Phone Handset**
Part No. 213360

Fig. 15 - **Rechargeable Battery Pack**
Part No. NT7M03BA

Fig. 16 - **Telephone Message Cassette**
Part No. 213404

Fig. 17 - **AC Power Convertor**
Part No. 213288

SECTION 060-NT7M-100

MOUNTING

5.07   Mounting Brackets (figure 18) to
       adapt the digital announcer series
of products for use in standard equipment
bays enclosures, or relay racks are
itemized in table 5. Different sizes,
shapes and finishes match the brackets to
the equipment and a variety of equipment
mounts, including Bell standard, RETMA,
and EIA universal. Brackets are also
available to support Northern Telecom
switching equipment such as the SL-1 and
DMS product lines. The brackets are
reversible and allow flush, protruding,
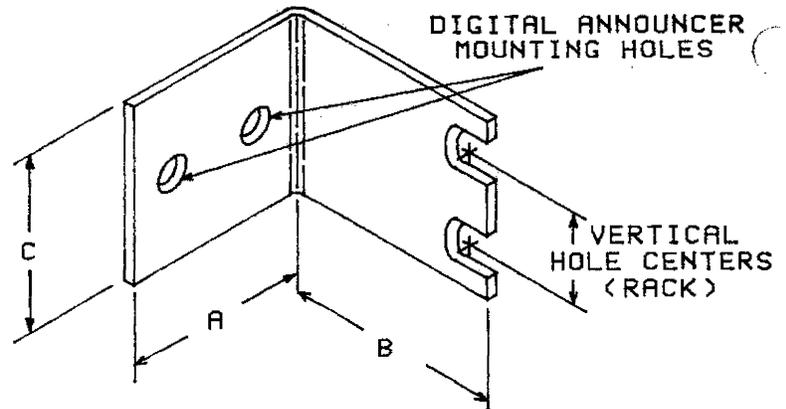or recessed mounting.

Fig. 18 – Mounting Brackets

Table 5. Mounting Brackets*

BRACKET KIT NO.	CHASSIS MOUNTED	STANDARD RACK WIDTH	HORIZONTAL HOLE CTR.	VERTICAL HOLE CTR.	LENGTH A	WIDTH B	HEIGHT C
213281 -101	1	19.00 inch 48.26 cm.	18.25 inch 46.36 cm.	1.25 inch 3.175 cm.	1.75 inch 4.445 cm.	0.62 inch 1.587 cm.	1.73 inch 4.365 cm.
213281 -103	1	23.00 inch 58.42 cm.	22.25 inch 56.52 cm.	1.25 inch 3.175 cm.	1.75 inch 4.445 cm.	2.62 inch 6.667 cm.	1.73 inch 4.365 cm.
213281 -105	1	26.00 inch 66.04 cm.	25.00 inch 63.50 cm.	1.00 inch 2.54 cm.	1.75 inch 4.445 cm.	4.12 inch 10.47 cm.	1.73 inch 4.365 cm.
213281 -113	1	28.00 inch 71.12 cm.	27.75 inch 69.22 cm.	1.00 inch 2.54 cm.	1.75 inch 4.445 cm.	5.17 inch 13.17 cm.	1.73 inch 4.365 cm.
213281 -117	1	23.00 inch 58.42 cm.	22.25 inch 56.52 cm.	1.00 inch 2.54 cm.	1.75 inch 4.445 cm.	2.62 inch 6.667 cm.	1.73 inch 4.365 cm.
213281 -119	1	19.00 inch 48.26 cm.	18.50 inch 47.00 cm.	1.25 inch 3.18 cm.	10.0 inch 25.4 cm.	.620 inch 1.57 cm.	1.73 inch 4.39 cm.
214605	2	25.00 inch 63.49 cm.	24.25 inch 63.49 cm.	3.00 inch 7.62 cm.	4.75 inch 12.06 cm.	3.70 inch 9.445 cm.	3.98 inch 10.13 cm.
214606	1	25.00 inch 63.49 cm.	24.25 inch 63.49 cm.	1.00 inch 2.54 cm.	4.75 inch 12.06 cm.	3.70 inch 9.445 cm.	1.98 inch 5.063 cm.

*   An assortment of mounting brackets are available. The brackets fit standard hole
spacing for both EIA universal and Bell standard mountings, and are painted black to
match the chassis (special finishes may be specified to match the brackets to the
customer's equipment; please contact the factory for assistance).

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SECTION 060-NT7M-100

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PRODUCT WARRANTY

The Digital Announcer is covered by the following manufacturer's limited warranty:

The Cook Electric Division of Northern Telecom warrants that the products purchased shall, under normal use and service, be free from defective material and faulty workmanship for a period of twelve (12) months from the date of shipment. Northern Telecom's sole obligation, and the Buyer's exclusive remedy under this warranty shall be limited to (at Northern Telecom's option) repair or replacement (on an exchange basis) of the defective product. Such obligation and remedy is conditioned upon (a) Northern Telecom receiving written notice of the defect within the specified warranty period; (b) Buyer receiving authorization from the manufacturer for the return of the defective product, (c) Buyer, at its own expense, returning the product to Northern Telecom, (d) the product not having been altered or repaired by any party other than Northern Telecom, (e) the defect not being the result of mishandling, abuse, misuse, improper storage, installation, maintenance, or operation by other than Northern Telecom (including use in conjunction with equipment which is electrically or mechanically incompatible); and (f) the product not having been damaged by fire, power failure, explosion, Act of God, or any other similar act or occurrence not attributable to Northern Telecom. The repair or replacement of any defective product shall not extend the applicable warranty period.

THE WARRANTY AND REMEDY SET FORTH ABOVE SHALL CONSTITUTE NORTHERN TELECOM'S ONLY WARRANTY WITH RESPECT TO THE PRODUCT AND BUYER'S EXCLUSIVE REMEDY IN THE EVENT SUCH WARRANTY IS BREACHED, AND SHALL BE IN LIEU OF ALL OTHER WARRANTIES, WRITTEN OR ORAL, STATUTORY, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. NORTHERN TELECOM SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER BEFORE OR AFTER SHIPMENT OF ANY PRODUCTS.

Please address any communication concerning this product to:

Northern Telecom
Cook Electric Division
6201 Oakton Street
Morton Grove, IL 60053-2722 USA
      Telephone   (708) 967-1555
      Telex I   72-4472
      Telex II   910-223-3654

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For more information, contact:

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